The Builder.

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Rate of Mortality among Architects and Building Artisans.

AS "Old Mortality," in years gone by, used to find congenial labour in re-lettering the crumbling Cameronian gravestones in the quiet kirk-yards, so to-day men put their hearts into the compilation of statistics of the diseases and deaths which have overtaken their fellow men. Doubtless, Old Mortality moralised as he worked, and educed some good from his labours. So do the statisticians of our own day, althongh their labours do not carry them to country grave-yards with green mounds and yew trees and a grey old church.

Several facts and lessons of importance may be learnt by men of all occupations, and of none, from a careful perusal of the Blue Book by Dr. Tatham, entitled "Supplement to the Fifty-fifth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England." Part II. of this supplement was published recently, and we propose to consider those portions of it which deal with architects and with men engaged more or less directly in building operations. In doing this, it will be useful to point out in what respects the diseases to which men in these occupations succumb differ from those of working men generally, using the term "working man" in its widest sense. At the outset, however, a difficulty arises, owing to the classification adopted by Dr. Tatham. Architects are not placed in a class by themselves, as are clergymen, medical men, and "the law," but are bracketed with artists (meaning, we presume, painters and draughtsmen), engravers, and sculptors. Whenever, therefore, architects are referred to hereafter, the word must be taken to include also these other branches of artistic work.

This difficulty does not present itself to the same extent in respect of men engaged in the several branches of the building trade, as the most important of these are formed into separate classes, namely: 60, bricklayer, mason, builder; 61, carpenter, joiner; 62, slater, tiler; 63, plasterer, whitewasher, paperhanger; 64, plumber, painter, glazier; 65, cabinet maker, &c.; and 66, sawyer. When, however, we come to consider what we may call the preparatory and subsidiary trades, we again find a certain amount of confusion in the classification; thus, "locksmith, bellhanger, and gasfitter" are classed together, as are "blacksmith and whitesmith," and the workers in "nail, anchor, chain, and other iron and steel manufactures." This grouping of trades could not have been avoided except by increasing the century of classes to which Dr. Tatham limited himself.

Dr. Tatham has improved upon the reports of his predecessor, Dr. Ogle, by further subdividing the causes of death, so that in these tables, instead of only thirteen headings, there are twenty-four. This, of course, while rendering rapid inspection and generalisation rather more difficult, adds to the value of the Report. Another important feature is the calculation of the rates of mortality for successive periods of life—namely, for the two quinquennial periods between 15 and 25, for the four decades between 25 and 65, and finally for all ages above 65. An example of this method of calculation and classification will be useful. In the three years under consideration, 1890-1-2, there were 1,297 architects, &c., between the ages of 15 and 20 (as enumerated at the census of 1891), and of these 9 died during that period, or 3 per annum, which gives a mean annual mortality of 2·31 per 1,000; during the same three years there were 4,943 architects, &c., between the ages of 25 and 35, and of these 83 died, or 27·6 per annum, giving a mean annual death rate of 5·60 per 1,000. In his tables, Dr. Tatham, instead of dividing the deaths by the number of years (3), as we have done, multiplies the lives by 3, and thus arrives at the same result. The following table has been compiled from the first table in the report, and includes statistics for "all males" and "all occupied males," in addition to the figures relating to the profession and trades forming the subject of this article; for further purposes of comparison, the rates of mortality for the three "learned" professions—the church, law,* and medicine—have also been included. The mortalities, however, are only given for ages above 25, as it is only then that the actual effects of occupation will, as a rule, begin to be seriously felt:—

Mean Annual Mortality of Males per 1,000 engaged in different occupations in the three years 1890-91-92, at successive periods of life:—

Ref. No.	Occupation.	Age 25-35.	Age 35-45.	Age 45-55.	Age 55-65.	Age 65 and upwards.
	All Males	*7·67*	*13·01*	*21·37*	*39·01*	*103·56*
	All Occupied Males	*7·29*	*12·43*	*20·66*	*36·66*	*102·32*
1.	Clergyman, priest, minister	4·23	5·18	10·52	25·35	83·60
2.	Barrister, solicitor	5·32	10·67	17·72	34·50	111·74
4.	Physician, surgeon, &c.	6·69	14·92	21·04	34·16	112·40
6.	Architect, sculptor, &c.	5·60	8·61	19·28	30·53	90·23
56.	Locksmith, bellhanger, gasfitter ...	6·52	12·03	22·22	33·88	90·79
58.	Iron and steel manufactures	8·81	15·81	28·50	55·30	157·04
59.	Copper, tin, zinc, lead, brass, &c., worker and dealer	7·43	13·98	24·55	46·02	119·22
59a.	Lead worker	12·14	22·78	37·62	75·32	281·25
60.	Bricklayer, mason, builder	6·55	13·45	22·04	40·23	107·71
61.	Carpenter, joiner	5·78	9·36	17·19	32·15	102·20
62.	Slater, tiler...	11·01	17·17	27·53	50·28	128·21
63.	Plasterer, whitewasher, paperhanger ...	6·93	13·77	22·17	48·57	89·71
64.	Plumber, painter, glazier	7·04	14·79	25·13	45·58	107·10
65.	Cabinet-maker, &c.	6·94	13·08	21·11	38·72	101·16
66.	Sawyer	4·84	9·54	15·44	35·32	126·65
89.	Stone, slate—quarrier	7·43	14·49	25·29	51·65	144·84
93.	Brick, tile—maker, burner	4·92	8·02	15·98	34·15	112·01
95.	General labourer	9·64	16·85	27·70	42·43	116·03

From this table it appears that the mortality of the class which includes architects is considerably below the average at every age, although the ten years from 45 to 55 appear the most critical. In comparison

* This refers to barristers and solicitors only; "law clerks" are placed in a separate class, and show (as might be expected) a much higher rate of mortality.

with other professions, the artists have nothing to regret except in the case of clergymen and ministers. Between the ages of 25 and 55, the sawyer, carpenter and joiner, brick and tile maker and burner, have even a lower rate of mortality than the artist, but above that age the positions are changed. The bricklayer, mason, and builder is remarkably near the general average for "all males," but the balance is against him when compared with the average of "all occupied males." The slater and tiler has an unenviable mortality at all ages, and the quarryman above 55 years old is even worse; but the metal-workers are in the worst plight, the mortality of lead-workers having been, during every period, about double the mortality of "all occupied males." As might be expected, the general labourer has rather a bad time of it, although better all round than the slater and tiler.

It is, however, when we come to look at the diseases to which the deaths in the several occupations are due, that something may be learnt of really practical use. The class of artists, architects, &c., which, at the last census, numbered 16,944 males above 15 years of age, suffers from alcoholism less than the average, but more than the average from diseases of the liver. Diabetes claims from among them twice as many victims as from the same number of average workers, but, as the deaths from this disease are only 17 out of 778 deaths between the ages of 25 and 65, it does not count for very much. The six principal causes of death among architects, &c., are as follows, the numbers being the proportions of the 778 deaths in this class, the deaths among all males being considered 1,000:—Phthisis, 146; diseases of the nervous system, 92 (probably these would be found to be architects who go in largely for competitions or who have much to do with committees); diseases of the circulatory system (other than valvular disease of the heart, 13, and aneurism, 8), 75; pneumonia, 61; bronchitis, 47; and cancer, 42. From gout, diabetes, aneurism, hernia, diseases of the liver and of the digestive system, Bright's disease and other urinary diseases, and plumbism, architects, &c., die more rapidly than the average. It is comforting to know that the death-rate in the triennial period 1890-1-2 was considerably less than in similar periods about 1871 and 1881.

The mortality from different diseases varies, however, very much in the different periods of life; in the earlier years phthisis is the most prolific cause of death, furnishing more than one-half the number of deaths between the ages of 15 and 20; the real deduction from which is, of course, that if a man (or boy) has phthisis in his constitution it is likely to carry him off at an early age. The proportion which deaths from phthisis bear to the whole of the deaths during the several periods of life, we have calculated as follows:—

From	15	to	20	years of age,	55	per cent.
„	20	„	25	„ „	46·6	„ „
„	25	„	35	„ „	41	„ „
„	35	„	45	„ „	25·5	„ „
„	45	„	55	„ „	17	„ „
„	55	„	65	„ „	5	„ „

Above 65 years of age, less than 2 per cent.

Although the proportion of deaths from this cause continuously decreases according to age, the actual number of the deaths from it increases up to the 25-35 period, but from that point a steady decline, both in numbers and proportion, takes place. About the same period an increase in other diseases is marked; pneumonia, bronchitis, and diseases of the nervous and circulatory systems appear rapidly to increase; the growth of cancer also is conspicuous. Between the ages of 55 and 65, the following are the principal causes of death:—Diseases of the nervous system, 29; diseases of the heart and circulatory system, 25; bronchitis, 11; urinary diseases, 10; cancer, 9; liver diseases, also 9; while phthisis comes seventh in order with 7. Above the age of 65, nearly the same order holds good, but the deaths are more numerous in proportion to the number living; the increase of bronchitis and urinary diseases during this last period of life is, however, very marked.

Let us now turn to a consideration of the diseases of the artisans more or less directly connected with the building trades. Metal-workers, who are a large class of 700,000 men above the age of 15 years, are exceptionally liable to death from phthisis and other diseases of the respiratory system, due in great measure to the irritating dust and noxious fumes which they must breathe; but under all the twenty-four headings, except alcoholism, rheumatic fever, gout, diabetes, accident, and suicide, their comparative mortality is higher than the average of "all occupied males." Locksmiths, bell-hangers, and gasfitters suffer chiefly from phthisis and diseases of the nervous and urinary systems; but they are a longer-lived class than the metal-workers as a whole, although a little worse than blacksmiths and whitesmiths. None of the metal-workers, however, are in such a parlous state as those who work with lead. Their comparative mortality, between the ages of twenty-five and sixty-five, is no less than 87 per cent. above that of "all occupied males," and of the total deaths at these ages, one-third are from pulmonary diseases and one-eighth from lead poisoning, but the mortality is also excessive from diseases of the urinary, nervous, circulatory, and digestive systems. Fortunately, the class of lead-workers is small, numbering at the last census only 2,072 males above the age of fifteen.

Taken as a whole, the members of the seven building trades (Nos. 60-66 in the previous table) suffer excessively from phthisis, cancer, and gout, among constitutional diseases, and also from diseases of the urinary and nervous systems, but the deaths from alcoholism and diseases of the digestive system are less than the average of occupied males, and, rather strange to say, their mortality from accidents and suicide is also below the average standard. When, however, the different branches of the trade are examined, more practical conclusions can be drawn. Bricklayers, masons, and builders, as might be expected from the nature of their work, suffer somewhat heavily from diseases of the respiratory system. Carpenters and joiners have a low death-rate, and do not suffer from any disease much above the average; cabinet-makers appear to be somewhat intemperate, and also inclined to commit suicide. Plasterers also are given to suicide, and die largely from cancer and diseases of the nervous, respiratory, and urinary systems. Plumbers, painters, and glaziers have a death-rate 18 per cent. above the standard, and suffer severely from lead-poisoning, which probably also accounts for many of the deaths from diseases of the nervous and urinary systems and from gout; they are also removed rapidly by phthisis, cancer, and rheumatic fever. But perhaps the most unexpected mortality is that among slaters and tilers. At all ages, the deaths among these are higher than the average of the building trades and also than the general average of workers; their general mortality is no less than 39 per cent. above the standard. No less than one death in ten is due to accident, a rate two and a half times the average in the building trades as a whole. Their mortality from intemperance is 23 per cent. above the standard, and that from urinary diseases is double the standard; they also suffer excessively from phthisis, and other lung diseases, cancer, and diseases of the circulatory system. What is more, their mortality was no less in 1891 than in 1871. Brick and tile makers may be considered a healthy class of workmen, but general labourers, who are, of course, among the worst clad and worst fed of men, perish from pulmonary consumption at a rate 37 per cent. in excess of the standard, from other diseases of the respiratory system 52 per cent. in excess, and from circulation diseases 26 per cent.; other diseases and accidents bring their death-rate to 28 per cent. above the standard.

In this hasty survey it has been impossible to do justice to such an important subject, but our words will not have been in vain if they draw the attention of masters and men to the excessive mortality in certain trades, much of which is undoubtedly preventible, and if they lead to further steps being taken to prevent accidents and to minimise, by the good ventilation and sanitation of workshops and by the exercise of all possible precautions, those diseases to which the men engaged in certain occupations are so terribly liable. To readers who wish to pursue the subject further, we can commend Dr. Tatham's report as a model of fulness, clearness, and accuracy. In conclusion it should be pointed out that the figures of the report are based on the deaths occurring in the years 1890-1-2, years in which the influenza epidemic was particularly rife, and this fact must be borne in mind when comparisons are made between these figures, and corresponding statistics for previous periods. Had it not been for this visitation, it is probable that a more general and conspicuous reduction of mortality would have been apparent in comparison with the mortalities of previous periods ten and twenty years before.

In reference to architects we may conclude with one word of general advice: do not overwork, and do not neglect bodily exercise. The less fortunate class of artisans, who are obliged to work at hours fixed by their employers (or, one might more truly say, by the influence of competition and supply and demand), cannot unhappily choose for themselves in these respects; if one of them has a constitution less fitted for the normal strain of the work than the others, he has nevertheless to make the best of it and take the same hours as the others, unless he can turn his hand to some other occupation. But when a professional man has got to that point that he can to some extent choose and command his own hours, he would be wise not to let his enthusiasm or his desire for still further success carry him into more work than his

constitution will stand. There is no doubt that Street, for instance, who was a man of exceptionally strong and healthy physique, killed himself prematurely by over-work; he wore out his brain while his body was still strong. Within the last two or three years there have been one or two much regretted deaths in the architectural profession in connexion with which it was remarked, by those who knew the habits of the deceased persons well, that they might have lived longer had they not confined themselves too close to their offices and neglected active exercise of any kind. On the other hand, one of the most prominent and energetic architects of the day, who has carried out an enormous amount of work, told us that he never took a cab to go anywhere when he had time to go on foot. When things come to the point that there appears to be more money than time to spare, it becomes very easy to fall into a habit of spending all the waking hours either seated in a room or being driven about. And with that habit comes decay of physical strength, and premature old age.

NOTES.

The London County Council.

SIR JOHN LUBBOCK published this week an important letter on some of the issues at the County Council Election. He pointed out that the policy of the Council in erecting workmen's dwellings was calculated to destroy private enterprise. The Council has spent 500,000*l.*, but have only housed 6,000 persons. From this it would appear that private enterprise has yet a good field before it. Those who really suffer are the ratepayers of London, who have to pay taxes to make up the loss on the municipal dwellings. Sir John also drew attention to the losses sustained by the Council doing their own work and to the excessive cost of the parks. The truth is that the Council is very much a body of amateurs engaged in business, and the great requisite of the moment is some check on financial waste. We doubt if it is possible that the Finance Committee can ever be a sufficient check: it is only a subordinate committee; but that some means should exist is certainly desirable. The difficulty is to find those means: the electors can do no more than return candidates pledged to economy.

A Question of Railway Carriage.

RAILWAY companies are often between two (or more) stools in consequence of disputes as to liability for carriage. A disagreement or misunderstanding between sender and consignee sometimes places them in a very awkward position, both parties assuming such a determined attitude that a deadlock ensues. Then, although on the best of terms with each, the company is compelled to invoke the aid of the law to obtain the amount undeniably due to it, but which neither party will pay. In a case of this nature tried before Mr. Justice Ridley last week an interesting point to builders and builders' merchants was raised. The circumstances were rather unusual, inasmuch as three parties were concerned in the transaction, without counting the senders at all. The claim was for the carriage of a quantity of bricks, which were consigned to A, transferred to the order of B, and by the instructions of the latter delivered to C. The railway company obtained judgment against the original consignee A, the bricks having been consigned "carriage forward;" but the judge directed that B should indemnify them, without prejudice to any rights they may have against C. Thus, the railway company get their money, while the question of actual liability as between the merchant and the builder is not affected. Of course the company might have simplified matters by insisting on the payment of carriage on delivery; but, fortunately, although they always reserve the right to do so, they seldom hamper business in this way if it can be avoided.

The New Railway Station, Paris.

THE design by M. Laloux for the new "Gare d'Orléans" on the Quai d'Orsay at Paris is published in *La Construction Moderne* for January 29, in the shape of two small-scale line elevations, without a plan. As far as one can judge from these, the design will have a certain force and character appropriate to a railway station. The successive openings on the ground floor, in the flank elevation, are covered by a series of very deep rusticated arcading, springing from rusticated piers. This portion of the design is "stopped" near each end by a pavilion with broken pediment, a *fronton*, and a high Mansard roof, the whole of this portion being in what we may call the usual French style. The whole building will hardly commend itself to English taste, but it will not be commonplace.

Holy Trinity, Aldgate.

WE read that in the course of pulling down some premises in Mitre-street the labourers found an old arch and spandrel which had been utilised as a support, and is conjectured to be a relic of Queen Mathilda's Priory of Holy Trinity, or Christchurch, once famous for its large and beautiful church, and the great wealth of its possessions. The Priory and precincts were brought in marriage to Thomas Howard, fourth Duke of Norfolk, by Margaret, sole daughter and heir of Thomas Audley, Lord Chancellor, and Lord Audley of Walden, to whom they had been given by Henry VIII. The Duke's son, the Earl of Suffolk, sold the Priory and Audley's mansion-house to the City of London; and in 1650 Oliver Cromwell gave the Jews license to settle there. The church of St. James, erected in Duke's-place (where Holbein lived) within the precincts in 1622-3, and rebuilt in 1727, was demolished about twenty-five years ago. A gateway of Holy Trinity was reproduced by Mr. George H. Birch, F.S.A., for his "Old London" street in the Inventions Exhibition at South Kensington, 1885; there are also views by N. Smith, January, 1793, J. Sewell, September, 1802, and R. B. Schnebbelie, 1825. That gateway, pulled down in September, 1816, had formed the principal entrance from the west—it was latterly known as the Thrum, or Mop Gate, from, it seems, the hiring of servants thereat.

Ormond-yard, St. James's.

A BLOCK of chambers has been erected at the north-east corner of Ormond-yard, York-street, after the designs of Mr. W. M. Brutton, of Trafalgar House, Green-street, W.C.* The yard formerly appertained to the house, in St. James's-square, of James, second Duke of Ormonde, who, having suffered attainder in 1715, retired to Avignon. He died November 16, 1745, and was buried in the family vault beneath Henry VII.'s Chapel, Westminster Abbey. A part of his house remains in the premises, No. 9 (entered from York-street), which were altered and repaired in the summer of 1890 for the Portland Club, upon their removal from Stratford-place, Oxford-street. The Duke of Ormonde's house was sold by the Crown for 7,500*l.*, and was valued at 300*l.* a year. In his "Tour through the Island of Great Britain," second edition, 1738, De Foe mentions "the house that once belonged to the Duke of Ormonde, since to the Duke of Chandos." It must have been of considerable extent, for he goes on to say that some four or five noble and good houses, together with stables and coach-houses in the rear, were built on its site. The original house seems to be one of those, thirteen or fourteen in number, for the erection of which on the north side of the square, on land owned by the Earl of St. Albans, a warrant was issued to Baptist May and Abraham Cowley, dated September 23, 1664. The houses were at first called "The Piazza"; May's names appear to survive, in a corrupted form, in the adjacent Babmaes-mews.

* Messrs. Courtney & Fairbairn, of Albany-road, Camberwell contractor.

Carborundum.

THE search for a process by which amorphous carbon can be converted into the crystalline form found in Nature as the diamond, has largely added to our knowledge of the reactions of carbon at very high temperatures with other bodies. Moissan especially, with his innumerable experiments with carbon mixtures in the electric furnace, has rendered great service to the scientific world, although he only appears to have succeeded in producing diamonds of a size too minute to be of any commercial value. Dr. Kohn has recently published some interesting facts concerning carborundum, which was discovered by Acheson in an attempt to obtain crystalline carbon, and although Mr. Acheson did not succeed in upsetting the diamond market, he appears to have discovered a very useful compound. Carborundum is a carbide of silicon, and is made by heating in an electric furnace a mixture of coke, sand, sawdust, and salt. The carborundum is taken from the furnace in the form of a mass of beautiful crystals. It is then ground, washed with dilute acid, and sorted into different degrees of fineness. The commercial value of carborundum depends upon its hardness, which is stated to be between that of the sapphire and the diamond. It is, in fact, sufficiently hard to be capable of polishing the diamond itself. It is manufactured in America by means of electrical energy, obtained by utilisation of the Falls of Niagara, and is sold as a powder and in the form of wheels varying in size from 36 in. downwards. Its chief competitor is emery, but it is claimed that although dearer than emery, carborundum can do twice the amount of work of emery, with a saving of 25 per cent. of the labour. In price, carborundum has dropped from 40s. per lb. in March, 1892, to 7½d. in October, 1897.

Systems of Charging for Electric Supply.

THE sliding scale system of charging for electric supply is beginning now to be adopted in London. Since the beginning of the month the Vestry of St. Pancras have given their

consumers the option of being charged at a fixed rate of 6d. per unit supplied, or of 6d. per unit for the first three hours they take their maximum current per diem and 3d. per unit afterwards, the maximum current during the quarter being measured by means of Wright's maximum demand indicator. It seems to us that the Vestry have done foolishly in adopting such a ridiculous sliding scale. Charging their consumers at a fixed price per unit consumed is unjust, but at least the usage is sanctioned by custom. If the Vestry wished to charge equitably, they ought not to have charged the unprofitable class who consume for less than an hour per diem their maximum current at the same rate as those who take it for three hours a day. Very few consumers take current daily equal on an average to their maximum current for three hours. The deserving person whose careful management enables him to get a discount will find that it barely covers the shilling quarterly rent of the tell-tale thermometer. The true system of charging for the electric light was clearly stated by Dr. John Hopkinson six years ago, and it is a pity that it is not adopted in its entirety by every electric supply company. Perhaps the nearest approach to an equitable tariff is that introduced by Mr. Arthur Wright at Brighton, namely, 7d. per unit for the first hour, and 1½d. per unit afterwards. Even on this scale, as Mr. Wright has pointed out, the constant user has to pay a share of the cost of supplying those who use their light irregularly.

Electric Cooking and Heating.

THE figures given in the paper on electrical cooking and heating, read by Mr. Adams to the Northern Society of Electrical Engineers, are nteresting and instructive. Most householders will be surprised to learn that if they intend to do all their cooking electrically they will consume on an average three times as much current as they do for lighting. At the present prices charged by the public companies this is almost prohibitive. We agree with Mr. Adams in thinking that it would be profitable for some of the supply companies to encourage cooking by electricity by charging a low price, say, a penny per unit in summer, for current consumed for this purpose. In country houses which supply their own electricity, especially when the motive power is water, electrical cooking has proved deservedly popular. Its greatest drawback is the expense of heating water, but in large houses or flats a slow combustion stove could be used to supply the hot water, and when this is done electricity for cooking at 2d. per unit would be profitable to both the companies and their clients. On the other hand, electric heating by radiators will never become popular until the price of electricity becomes very much less. A unit per hour, roughly, is needed to heat every 2,000 cubic ft., and the supply companies are not likely to reduce the price of electricity for heating, as the heating load overlaps the lighting load and is heaviest in the winter time. The City of London is an ideal place for electric heating, but so long as the company charges the exorbitant price of 8d. per unit, there will only be a small demand for this purpose. Where power can be had cheaply, electric radiators for heating are in request. In ship-heating, for example, they are replacing the older and more troublesome method of heating by steam pipes.

South African Society of Architects.

THE "Proceedings of the South African Society of Architects and Engineers," Vol. III., come out rather late, as they include meetings between the dates of October 30, 1895 and June 30, 1897; but the volume contains a good many interesting papers. Among the subjects treated of are "History and Civilisation as evidenced in Art and Architecture," by Mr. Arthur H. Reid; "American Timber," by the same author; "The Manufacture of Transvaal Cement," by Mr. H. D. Griffiths; and "A Rational Sewerage System," by Mr. Theodore Reunert. A short and suggestive paper by Mr. H. D. Griffiths, on "The Decimal Divison of the Circle," which touches on a subject of world-wide importance, we reprint in another column. The headquarters of the Society is Johannesburg. We may congratulate them on a volume which, though, as observed, it is rather long in coming out, contains so much interesting matter, and which promises so well for the future of the Society.

Mr. Macwhirter's Exhibition.

THE exhibition of Mr. J. Macwhirter's "Scenes in Scotland, the Mediterranean, and America," at the Fine Art Society's Gallery, is noteworthy not only as being a fine collection of fresh and broadly treated open-air studies, but also as showing a greater variety than we had expected to find among the studies of a landscape painter who in his larger works has been rather restricted in his choice and treatment of subjects. Among many admirable sketches we may draw attention especially to "Looking to Italy from Taormina" (5) in which the sheeny look of the bright blue sea is beautifully conveyed in a somewhat slightly executed sketch; "Cemetery of Eyoub, Constantinople" (6), "Loch Achray" (9), "Glen Aric" (10), remarkable for its fine colour; "The Coolin Hills, Skye" (11), "Evening, Kinrara" (25), and "The Tay from Perth Bridge" (70). "The Site of the Ancient Port of Corinth" (69) is interesting in a topographical and archæological sense. There are also some charming studies of flowers for foregrounds, "Anemone and Gentian" (79) in particular. Why does the artist add the word "Night" to the little sketch of "Richmond, Yorkshire" (34)? It certainly does not convey the impression of night.

Elections at the Royal Academy.

AT a meeting of Academicians and Associates of the Royal Academy on Wednesday last, Mr. B. W. Leader and Mr. J. Seymour Lucas were elected Academicians, and C. Napier Hemy an Associate. Of the election of Mr. Seymour Lucas artistic opinion will generally approve. As to the election of Mr. Leader there is likely to be more difference of opinion. He is undoubtedly one of our most "popular" landscape painters, but he is not one whose works can be regarded as calculated to uphold the status of English landscape art in the eyes of the foreign critic or of the best informed persons in England. And when we consider, along with this honour paid to him, that so truly artistic a painter as Mr. Napier Hemy has only just arrived at the honour of being an Associate, one can only conclude that in regard to landscape the Academy is still pervaded by the same spirit which induced them to sky Alfred Hunt's pictures and refuse him the compliment of election.

THE ITALIAN RENAISSANCE.*

BY PROFESSOR AITCHISON, R.A.

THE object of lectures on architectural subjects is not merely to enlighten you on the subject of which they treat, but to show how lessons may be learned which may improve and advance the art. I do not know a more useful example to give than the works of Machiavelli. He not only studied deeply and read widely the history of the past, and acutely observed the affairs of his own day, but his object was not to teach history in the ordinary sense, but to extract from the histories he had read and from the affairs in which he had been engaged those principles which had been followed by successful nations and by successful individuals. He saw what nations had done and what people did, and was not misled by what they ought to have done.

Now, this is the way in which we must study past architecture. It is not for the purpose of using it again, but to find out what were the underlying principles which made these past epochs not only delightful to their contemporaries, but also what has given them those qualities which make them delightful to us. You must remember that all the successful architects have given their contemporaries something novel which charmed them; if the novelty was an advance posterity has been charmed too, but if it was a step backward or awry it is either laughed at or execrated by posterity. I shall hereafter say something about the causes which brought about the Renaissance in Italy, but at present I mean to confine myself to the lessons we can learn from the works of their great masters. It is not now necessary to consider how these tastes arose, but it is undoubtedly the case that there was a general desire pervading society to have something more simple and more elegant than existed in their Gothic structures, for they christened Gothic "the tasteless style."

We, as architects, look with architectural eyes on all structures; we ask that the outside should reveal to us their internal uses, and that they should be stamped with the character that their use demands: that the inside shall not only be perfectly fitted to their use, but be becomingly and architecturally fitted. That there shall be a reasonable proportion between the masses and the weights that they bear, and that the whole should not only be sightly and agreeable, where sightliness is proper, but that the whole should bear the stamp of intelligent and properly economical construction, made to take the form that is becoming to its use. The proper concentration of light and the treatment of enormous windows has not yet been solved architecturally in the Renaissance. Nature, if I may so say, is obliged to make all her living organisms capable of living properly, but she benevolently makes a large part of them agreeable or delightful to man's eye, and gives them all, ugly or beautiful, characteristic shapes. However much vastness and mass may momentarily affect us, we are rather disgusted than pleased when we find that this vastness and this massiveness is disproportionate to the uses for which they were employed.

It seems to me that neither the architects nor the Italian public were in the least affected by these metaphysical considerations. If the whole structure that presented itself to view was dignified, impressive, or delightful, the Italian public never asked themselves if these qualities were obtained by a lavish and extravagant waste of material; and, too, it must be recollected that in the days of the Renaissance there was almost a horror of anything that brought to mind the asceticism and hindrances to free thought of precedent times. Besides this, classical peculiarities were new and delightful in their eyes, and they sought to overlay the Christian civilisation of the immediate past with pagan beauty and pagan symbolism. The staff of the augur, the knife of the sacrificer, the altar on which the victim was sacrificed, the skulls of the victims, were chosen as ornaments, although their symbolism had really nothing to do with the civilisation

* Being the first Royal Academy lecture on Architecture this Session. Delivered on Monday afternoon, January 31,

of the day; but as every one was more or less steeped in classical lore, it showed that the architects were under the same influence; and there was, too, at that time a strong desire to weld Christian and Pagan symbolism into one whole. This desire is now extinct, and we scarcely tolerate Pagan symbolism unless it is clothed in peculiarly attractive or beautiful forms.

Nearly the whole of the Early Renaissance architects were goldsmiths, sculptors, and painters, and consequently votaries of the beautiful; they certainly strove to improve on the Roman ideas of beauty, and at the same time they acquired a taste for elegant proportions, and for a certain simplicity which was far removed from Gothic ideas. What we have to learn is how this sense of proportioning, this simplicity and breadth, this perspicuity of effect may be applied to different forms and different proportions. To speak of one thing alone, the climate of England is very different from that of Italy; we rarely have hot weather or superabundant light; in fact, so far as light is concerned, we scarcely get sufficient in town buildings when the whole of the front and back walls are of glass. The exclusion of light and heat and an ample supply of air are necessities in a very warm climate with a blinding sunshine, so that when our buildings are not for military purposes, the plain spaces, which give such dignity to buildings in a warm climate are difficult of attainment, for we live in a country where every gleam of sunshine is valuable. We have, therefore, to cultivate this sense of elegant proportion, and to apply it to the new cases that arise in our own country.

We, as architects, should not forget that we have to express our own views of architecture; we have to raise the emotions that should be raised by the uses of our buildings by different means and by a different treatment from that which was adopted by the Pagans of ancient Rome or their Renaissance successors; but we want to clothe our works with a similar dignity, beauty, or expressiveness, so that future generations may look with the same admiration on our works that the works of the Romans or their Renaissance successors have excited in us; no easy task, but one that every architect should set before himself and try to accomplish. We cannot, if we would, turn the minds of the present generation from scientific investigation, and from the application of the laws of nature to man's use; but there does not seem any reason why the delight in beauty for its own sake should not co-exist with the desire for penetrating into nature's secrets, or applying them to our use. The discoveries of the laws of nature have an irresistible attraction for certain minds, and their application to man's wants is followed by power and wealth, which has irresistible attractions for most minds; while the rendering ourselves capable of enjoying every beauty of nature and art not only centres itself in the individual, but has no other effect than that of raising, improving, and filling him with delight. It is, perhaps, natural that the bulk of mankind should pursue that which leads to power and wealth; but, at least, it should not prevent those who are blessed with higher aspirations and more delicate sensibilities from doing the best they can to perfect those faculties in themselves by which they can appreciate and enjoy beauty and loveliness. I am afraid it is not common for people to perfect themselves to any high degree in those arts to which the bulk of mankind are callous, and from which they can expect little praise, little admiration, and, perhaps, no pecuniary reward; but still we do find that, in some of the fine arts, the mere practice of it brings its own reward. This, I think, is peculiarly the case with music, but I do not see why it should not exist in all the fine arts. Milton caught a glimpse of the really beautiful and admirable soul when he speaks of fame as the "Spur that the clear spirit doth raise," and calls it very properly "that last infirmity of noble mind." To appreciate and still more to create things of beauty, should be a desire and aim in itself, and until this is so we can hardly expect to raise ourselves to the heights that have been attained by the great minds of the past.

There are a few people one has read of who calmly pursue that simple desire to do their duty, to help and raise their fellows, and to perfect all their own capabilities, without any hope of reward, except the satisfaction of feeling that they are acting rightly. Such a one may say I make "my life a perfumed altar flame;" it is this spirit that must be cultivated if we are ever to attain to the excellence we all desire to possess. Even now almost every architect may be sure that if he constructs an excellent building that proclaims its purport, that his exertions will not be wholly thrown away. There are sure to be some people whose souls are attuned to admire the beautiful and the perfect, who will thank, mentally at least, the creator of this joy for themselves. In the turn of fortune's wheel there is no doubt that loveliness, beauty, and terror will in some future time again have the ascendancy over man. I say this because it is evident to me that Nature has provided these things for man's solace and delight. We cannot suppose that all these forms and colours of beauty which she particularly spreads before our eyes at sunrise and sunset, and the blackness of storms, the lightning and thunder, are not secondarily created for the advantage of man; the bulk of everything Nature makes is beautiful, and it is not to be supposed that at some future day man will not desire to make every work of his hand as lovely, as beautiful, or as impressive as the works of Nature.

I cannot forego the desire for real architecture, for any other gift, *i.e.*, the making of a well-ordered organism after the fashion of Nature's; but if our aim were like that of the Renaissance architects, to make something dignified, impressive, or beautiful in architectural language, without regard to its other architectural qualities, we should have to abandon our present procedure and revert to that of the Renaissance, *i.e.*, to learn to be handy with our fingers as goldsmiths, which involves a deeper knowledge of form than most possess, as well as an advance in draughtsmanship and modelling. In Renaissance days those who felt that they could rise higher, perfected their early studies by a more complete study of painting, modelling, and composition, and became distinguished painters, modellers, and architects.

We cannot be sure that we have the vigour of mind and body which distinguished these Renaissance artists, still we can employ all the talent and vigour we have in this direction, but if we are to be architects, we must add to it that knowledge of the use of materials that is called construction.

I do not know of a more startling instance of the vigour and versatility of mind of these Florentine craftsmen than the story of Giuliano da San Gallo. He and his brother Antonio, in their returns for taxation, described themselves as carpenters; but then, as in Scripture times, a carpenter was a wood carver as well. Giuliano was carving some of the stalls of the Cathedral of Florence, when the Duke of Calabria made war on Lorenzo de' Medici, and Lorenzo wanted a military engineer to fortify Castellana, and whom should he pick out but Giuliano, and told him to pick up his tools and go and fortify the town. Giuliano, being conscious of the want of skill and timidity of the gunners, took them in hand, and so well did he train them that the Duke raised the siege. You all recollect that the Pope made Benvenuto Cellini his master gunner when he was besieged in the Castle of St. Angelo after the sack of Rome.

Almost every one of the great Italian artists of the Renaissance was a craftsman, so I am by no means sure that we have much to thank Sir W. Tite for, when he put a stop to architects being craftsmen, and I think we shall have to go back to craftsmanship. Certainly, if architecture is ever to go on again as a progressive art we must before all things be constructors, for how can a man who is not a constructor advance a consructtive art? I think there is no doubt that the early architecture of the Renaissance was the most beautiful architecture the world has seen since Athenian days. You have only to look round an architectural exhibition to see it, only these men were not constructors. My business at present is to show you what made it so beautiful.

Almost all the artists of the Renaissance were either sculptors or painters, and their constant study of the human figure gave them particular insight into the beauty of form, and more or less into how it was attained, and their study of Roman work also gave them an insight into how the Romans attained it; while even the very fact of their being painters or sculptors showed that they were men blessed with invention. They had, when they worked as architects, the guidance of the sizes and shapes of their buildings and the door and window openings. There were still remaining in Rome, the ruins, at least, of many buildings that have perished since. They, therefore, had little else to do than to perfect the form of what was ready made to their hands, and after the first few years they had the methods of proportioning the Romans used, that they learned from Vitruvius. They had, too, a beautiful climate with much sunshine, so that they were almost as well able to play with light and shade as the Greeks themselves.

Perhaps, of all the buildings left us, the east end of Sta. Maria delle Grazie, at Milan, is the most perfect; the variety of shapes, the elegance of the proportions, the breadth of effect and the beauty of the forms used are, perhaps, more conspicuous here than in any other of the exquisite buildings that have been left. The large plain surfaces were only broken up enough to make them interesting, and at certain times the wide shadows cast by the projecting eaves gave the exact proportion of light and shadow that made the building both effective and charming. The polygonal shape of the peristyle that surrounds the dome is admirably contrasted with the horizontal lines of the end of the choir, the small tower above it, and the side projections; while the curved eaves of the apses admirably contrast with the vertical and horizontal lines. This was by Bramante, the great architect of the Renaissance.

Perhaps, next to that, the Scuola di San Marco at Venice is the most lovely building of the early Renaissance, and I am now speaking of the front to the Piazza. All important buildings in a city impress themselves on the memory of the inhabitants, and more especially on that of the architects, so it is not surprising that the half-round gables of St. Mark's were repeated here. The variety of its skyline prevents any look of stiffness about it, and although it is cut into two nearly equal parts by the entablature of the ground and first floors, all the vertical divisions are most gracefully graduated, blank wall-spaces are left on the first floor to repose the eye from the elaboration of the door and window dressings and of the lower frieze and pilasters, and the whole treatment is delicately varied in colour. On the ground floor the grand doorway is one of the most perfectly proportioned and elegantly adorned features that exist; the ornamented parts of the building are admirable in various ways, and contrast delightfully with their surroundings. It would be absurd to attempt to give any of its proportions that might be of use again, as the whole composition is so strongly marked as the outcome of the skilled master of delicate sensibilities, who was full of invention. The semicircular head of the main doorway is repeated on a larger scale in the crowning head of its canopy, borne on two columns with carved drums, pedestals, and capitals, supporting a projecting entablature above; and, lest the edge of the half-round canopy should cut too sharply against the plain background, it is fringed with open-work scrolls running up to the pedestal of Madonna and Child that make a finial to the canopy. The attic has a semicircular gable which again repeats this feature. This work, like all the early Renaissance work, is strongly marked by a profusion of ornament, and has by no means the artistic simplicity of the Greeks, but at the same time it has an ineffable charm of its own. This canopy stands out in front on a large blank space, flanked by two pilasters, the space itself below its crowning entablature being panelled with white panels with coloured marble frames, and on the attic above the entablature is a large projecting shelf bearing the winged lion of St. Mark, with four bells below the shelf. The spaces between the pilasters on the ground floor on either side of the grand doorway are filled in with vaulted chambers in perspective, each chamber containing a lion. Further to the right are two open loggias in perspective, with coffered ceilings, on either side of the smaller doorway, and each of the loggias contains figures. These architectural perspectives have been found great fault with, although they met the taste and fashion of the time, and so have the gates of Ghiberti, but I am inclined to look with contempt on *à priori* criticisms of beautiful things that have captivated mankind. Such buildings as these can neither be copied nor paraphrased by any but those blessed with equal genius, equal sensibility, and of equal cultivation.

Although Venice is full of these elegant and original conceptions, I think there is nothing that can quite equal the Scuola di San Marco in that happy lightness and variety of invention,

except that mural monument to Orsini and Zen whose principal form is a circular medallion, where a shelf below its centre supports a carved sarcophagus which bears on its top a kneeling figure of a woman with a child beside her, whose heads and busts break the formal line of the circle. Below this is another shelf supported on a form like half a shield, with scrolled brackets at the ends; this shelf bears a winged figure at each end, supporting a shield, while the middle is joined to the circle by a double-headed eagle, from the bottom of this support is hung an inscribed medallion. The stiff form of this medallion is well contrasted by floating ribbons and bunches of flowers.

The early Renaissance buildings of Venice run to this sort of delicately irregular invention apparently from the contagion of dazzling sunlight and the rippling shadows of the water, from there scarcely being an upright line in any building, and from Venice being a city of pictured and marble walls, which the sun, the frost, and the sea-breeze have softened to the colour of an iridescent shell, while the atmosphere itself turns everything into mother of pearl.

At Brescia there is a portico to the church of Madonna dei Miracoli, which, although very rich and much carved, with, it is said, lapis lazuli backgrounds to the carving, is a trifle stiff, and the columns, though of considerable size, are comparatively small to the large superstructure over them. The architect, who is said to have been Beretta, had a happy idea by which he gave a certain freedom to the portico, and at the same time greatly increased the scale of the columns. At the bottom of these columns is a carved drum and the columns and bases stand on a continuous pedestal; through the centre of this pedestal and between the two middle columns is the main entrance into the church. By carrying through the capping of the carved drums as a lintel, the architect has added scale and dignity to the columns, and by a little bit of open scroll work over it he has given to this feature a playful air.

Other specimens of the delightful Early Renaissance are to be found in the Church of Santa Maria dei Miracoli and the Cornaro-Spinelli Palace at Venice. Unless you are imbued with the feelings of admiration for delicate work, native beauty and refinement made by a people entranced with colour but not insensible to form, you miss the charm of the Early Renaissance in Venice, and more appreciate the delicate but more restrained beauties of the early Florentines, who were not colourists.

I now show you the Spinelli Palace, and the outside and inside of Santa Maria dei Miracoli, as I saw them in 1854. The inside had then all the historic additions of the ages it had passed through, these are now removed and the walls have been scraped, polished, and the ceiling repainted. The restorers have tried to bring back its appearance when first completed, but they could not be animated with the glow of those to whom the discovery of how to produce beauty was almost a divine revelation, even if the moderns had possessed the ancient skill.

SIR W. RICHMOND'S LECTURES.

SIR W. RICHMOND'S concluding lecture on Painting, at the Royal Academy, on Thursday last week, dealt with the subjects of Form and Colour, and was a remarkable lecture for its union of literary excellence and practical suggestion. In commencing his remarks he dwelt on the increasing importance now attached to the craftsmanship element in art, and hinted that this would probably in the near future receive more attention from the Academy.* It was in accordance with this increased importance attached to the constructive side of art that he would urge them to base their studies of painting on the drawing of the skeleton, as the foundation of all figure painting. The influence of impressionism was rendering the art-students careless as to accurate study of this kind, and the drawings of the skeleton now sent in by students were inferior in general to those which were executed by the students of his own time. To draw the figure they must know the skeleton accurately, and should be able to draw all the joints from several points of view, from memory. All drawing was an act of memory, and the power of memory could be strengthened by practice and cultivation. The artist ought to have the knowledge of the construction of the body at his fingers' ends. Lectures on anatomy were only of use if put into practical application; and the study of anatomy had to be kept up throughout life, and not merely during student days. Sir W. Richmond then proceeded to describe his own method (which he has before described in a paper read at an Art Congress—we forget where at this moment) of forming a skeleton of copper wire, with cork for the pelvis, and laying on the principal muscles in wax; one of the best methods possible for impressing the whole system of muscle attachment on the memory. In connexion with this he would refer them to the small wax models made by Michelangelo for the study of figures for his pictures, some of which were to be seen in the South Kensington Museum. The Greeks, it must be admitted, did not study anatomy scientifically, but they were very keen observers, and they had the nude figure in life and action constantly before them.

Turning to the subject of drawing, the lecturer mentioned four methods: silver-point, pencil, charcoal, and crayon. Silver-point was an admirable medium for delicate drawing of the figure or portions of it, for such things as studies of heads, hands, and feet, and it had the advantage that its lines were indelible, but on this very account it required very careful handling, and in the nature of its effect also it was only suitable for delicate and carefully-considered work; no "scribbling" was allowable with it. Pencil had a much wider range, but the effect should all be got with one pencil; two pencils of different quality should not be employed on the same drawing. Charcoal, on smooth paper, was a splendid material for studies, and was in fact more like painting than drawing. Crayon on tinted paper was excellent for such things as drapery studies; the ground of the paper should form the half-lights, the lights and shadows being put in with white and black crayon.

Every design for a figure or a group of figures must express action, and it might be observed that slight and refined gesture was more difficult to express adequately than violent action. Students should never go anywhere without a pencil and sketch-book, prepared to make a study on the spot of whatever presented itself for study. On the other hand he would never advise them to design a figure with the model present, but to refer to the model afterwards to correct the design. In the process of inventing a picture, spaces and planes had first to be considered. The right proportion and shape of the canvas was a point of considerable importance; many pictures were injured in effect by the bad proportions of the canvas. The first lines in a composition were to be respected, and not rashly obliterated, when they had been the result of careful consideration. On these first lines the success or failure of a picture was mainly built. The first rough idea for a picture, however, might often be susceptible of greatly improved development, little by little, just as, to compare painting with music, many of Beethoven's finest themes were hammered out by degrees from a comparatively crude initial idea. But the alterations should be done on a tracing, so as to preserve the opportunity of comparison with the first idea before sacrificing it. No model for a separate figure should come on the scene till the whole composition was matured in its grouping, perspective, and planes. He had found it very useful to make little dummy figures in wax, and arrange them on a small imaginary ground plan of the scene, so as to study their grouping and the arrangement of planes. It was a good thing also to roughly model the architecture and surroundings of the scene; and project the shadow of this on the canvas with a lantern. Then came in nature in the shape of the model, from which not only the general figure, but each head, hand, and foot should be separately studied. The studies for the drapery came last of all.

In studying the colour scheme for a picture, make the study on a small scale, but quite decided as to colour.* The ground for the actual picture should be as white as possible, as it was the tendency of pigments to become more or less transparent with the lapse of time, so that a dull ground would in time make its effect felt on the picture. The picture should be sketched in first with weak size and powder colour—distemper, in fact. It was well then to put it by for a few days, to recreate the mind by looking at other pictures, but only pictures of the same kind or class as that which you were intending yourself to paint. The distemper picture having been fixed with some such material as Bell's mastic varnish, and left to dry for a day or two, was then ready to be proceeded with as an oil picture. Mix some flake white and rub it thinly over the extent of canvas to be first painted on. The object painted should always be kept before one while painting. Embroideries and other such delicate details should always be drawn with great care; clumsy or careless handling of such things would not do. For very bright colour paint into wet white with transparent colour. For the bright portions they should not be afraid of cool colour. The Venetian artists habitually painted the lights with cool and shadows with warm colour. Colour in shadows was generally warm. After the colouring was finished, let the picture dry for glazing with semi-transparent colour, with which the most beautiful effects might be produced.

In regard to drawings and sketches, Sir W. Richmond drew attention to examples of various methods of drawing which were hung on the walls; a set by Botticelli for the "Divina Commedia," a remarkably refined drawing by Ingres, various examples by the late Mr. G. Richmond, R.A., and also bestowed especial praise on some of Cockerell's sketches of ancient architecture which were exhibited; slight in execution, but representing clearly what they were meant to represent; not like some of the modern sketches which might be hung either way up. In conclusion, he exhorted the students to endeavour to see the best in everything. *Nil admirari* was the motto only for those critics who had nothing to say. Referring to the fact that the Gold Medal had not been awarded this year, he hoped they should see better work from the students two years hence, and that they would be inspired to higher efforts by the glorious exhibition of Millais' work in the adjoining galleries. Recapitulating the general drift of his lecture, he reminded them again of the importance of the "Arts and Crafts" element in art. A wooden spoon, treated in a truly artistic spirit, might be a better expression of art than an oil-painting. The students' work, moreover, had become too tentative recently, too like the work of amateurs. They must learn to work on a definite system.

* It is perhaps unnecessary to remind our readers that we have repeatedly urged that an "Academy of Arts" ought to be concerned to develop and encourage every form of art, and that "art" does not mean "painting." That this view has not been acted upon by the Royal Academy is not the fault of Lord Leighton or Sir W. Richmond; but it is to be feared that a good many of the painters who form the majority in the Royal Academy are more narrow in their sympathies.—ED.

* Some of Lord Leighton's miniature colour studies for large paintings are admirable examples of this.—ED.

NOTES ON THE DECIMAL DIVISION OF THE CIRCLE.*

THE metric or decimal system of mensuration, which has been in use among several of the European nations for nearly a century, and which is gradually but surely forging its way in all British scientific bodies and schools, possesses admitted and enormous advantages, from a scientific as well as a practical point of view, over our present system of mensuration.

These advantages are familiar to most of us, although through an innate sense of conservatism we hesitate to profit by them, and prefer to restrict ourselves to the traditions of olden times, and it is not my purpose to advocate the universal use of the decimal system, that task having years ago been ably undertaken by our leading scientists.

Most of us feel compelled in many circumstances to resort to the decimal system, and there cannot be the slightest doubt that, in the course of time, our methods of measurement will become obsolete, and will be replaced by methods more scientific, more simple, and more expeditious.

Examples—Areas, cubes, cubic contents in gallons, circumference, AD; area of circle $\cdot 7854\ D^2$, no relation between standards of length and capacity and weight.

Although the decimal system is in itself perfect, yet it is strange to find that, in countries where it is adopted, an anomaly exists as far as regards the relation between the divisions of the circumference of a circle and those of time.

* A paper read before the South African Association of Architects and Engineers, by Mr. H. D. Griffiths, Vice-President.

This anomaly, which has so long escaped attention, occurs in our system of division of time into twenty-four hours, and of the hour into sixty minutes, and it has recently been pointed out by M. Henri de Sarrauton, a French engineer of great ability, who has published an elaborate paper on the subject.

Such a division involves the use of three different scales of calculation, with incomplete common ratios, since the seconds are generally divided into fifths, tenths, and hundreds, and the aliquot divisions of time thus comprise both duodecimals, sexagesimal and decimal relations.

Our system of dividing the circumference of a circle into 360 parts is equally anomalous and inconvenient.

It is true that a division of circumference of a circle into 400 parts or grades is adopted in certain mathematical computations, and that this lends itself to the application of the decimal system, but this alternative system has so little in common with our admitted division of time, that it cannot be used in astronomy or navigation. The corresponding divisions of the circle and of time have a constant ratio of 1 to 15, a ratio which is not a decimal one, and therefore is not convenient for the purposes of calculation.

In order to simplify matters, M. de Sarrauton proposes to reduce the divisions of the hour to the decimal system, that is, to divide the hour into 100 minutes, and the minutes into 100 seconds. The length of the day is determined by the time of revolution of the earth round its axis, that is to say, by the time consumed by any point of the globe in describing a complete circle, so as to come back to its original position as regards the sun.

Retaining, therefore, the division of the day into twenty-four hours, the correlation between circular and time measurements would be most clearly defined by dividing the circle into 240 degrees, the degree and hour into 100 common minutes, and the minute, both of time and angular measure, into 100 seconds.

This, in itself, would not only introduce greater simplicity and more speed into these complex calculations, but it would immeasurably diminish the liability to error incurred by the use of a number of different systems.

The relation between time and angular measures being thus established, we have a system capable of being readily put into practical use in astronomical and nautical calculations.

The equator being divided into 240 decimal degrees, the sun would therefore traverse 10 degrees in one hour, instead of 15 degrees, as in the present system.

Having a globe representing the earth divided thus, let us, for instance, select a point, say, 27 degrees, 4,230 east of the meridian. The sun travelling apparently over 10 degrees during the hour, we see at once that when the sun is passing the meridian at twelve o'clock, the time at that particular point is 2 o'clock, 74 minutes and 23 seconds decimal.

Therefore, a chronometer which has been regulated with the fixed meridian will indicate at a glance the longitude of any spot where a ship may be when the sextant indicates that the sun is at its highest point.

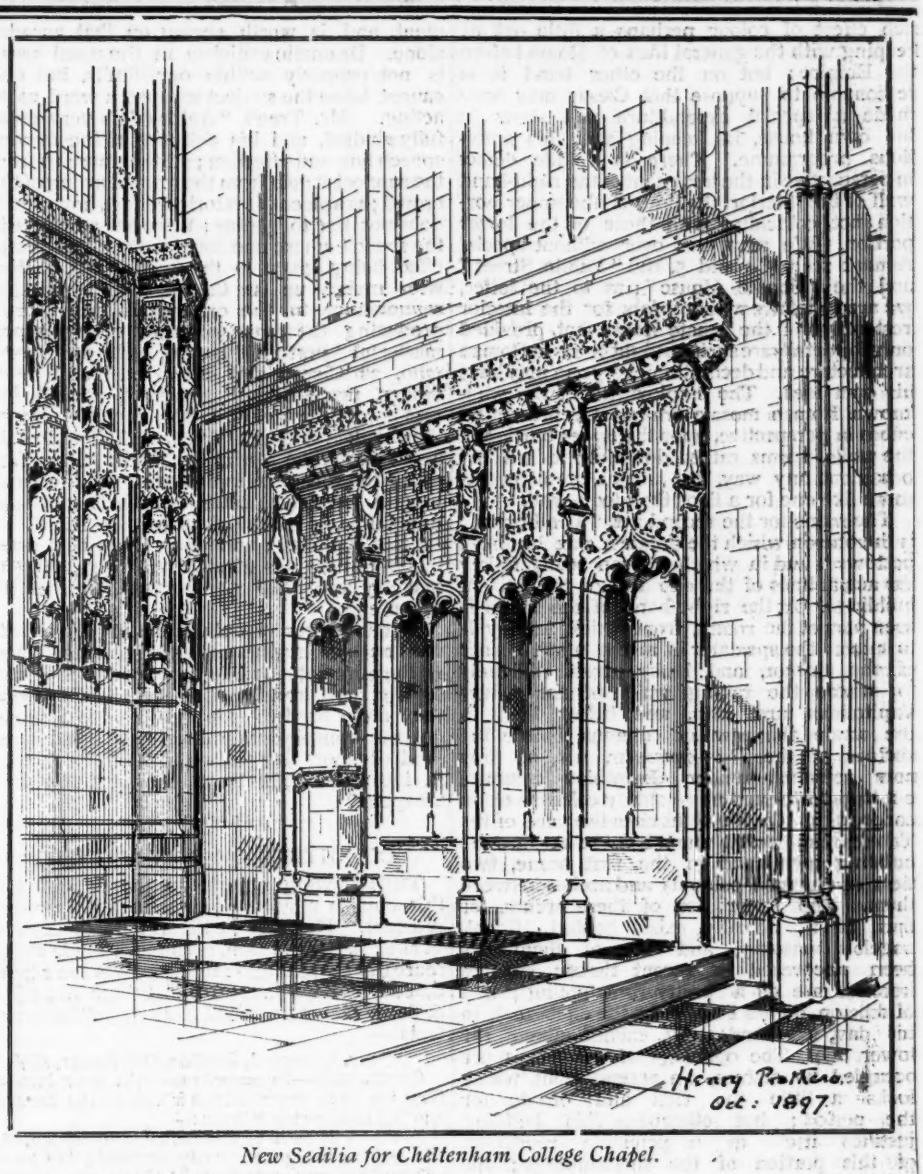
A watch divided according to this system possesses, among others, the following advantages :—

That it enables one to read the hours according to the present system in use ; that, in ordinary observations, it gives a greater degree of accuracy than the present system of 60 seconds in the ratio of 100 to 36 ; that it gives at once decimal numbers amenable to immediate calculations by ordinary rules or by ordinary logarithms ; that it gives a constant correlation between time and angles, and that it is capable of giving the exact longitude of any place.

The adoption of this system of angular division would necessitate a complete reversal of our present acknowledged methods of angular logarithms, but would in no way interfere with our trigonometrical system. For practical purposes, in addition to simplicity, it is easy to see that we should still have some fixed relations for sines, cosines, &c., as in the present system. It simplifies also the reading of verniers on scientific and surveying instruments.

The first steps towards the adoption of the decimal division of the clock has already been adopted in certain parts of Italy and India, where the quadrants of railway clocks have been divided into 100 minutes.

It is certain that the great advantages of this new method of the division of the circle will render it popular among scientists, and that in the course of time we shall see its general adoption.



New Sedilia for Cheltenham College Chapel.

SEDILIA FOR CHELTENHAM COLLEGE CHAPEL.

IT is intended to place Sedilia in the new chapel of Cheltenham College as a memorial to the late Archbishop of Dublin, who was an "Old Cheltonian." They will consist, as shown in the drawing, of the usual three canopied seats and a Credence. Clunch stone will be employed, and the work will measure 14 ft. in width and 18 ft. in height. Mr. H. Prothero (Messrs. Prothero & Phillott) is the architect.

THE SCENIC SETTING OF "JULIUS CÆSAR."

SHAKESPEARE'S "Julius Cæsar" being a play in which the action lies for the most part in ancient Rome, the treatment of the scenery is a matter of some interest in an architectural sense. It is understood that it has been carried out under the advice of Mr. Alma Tadema, whose familiarity with Roman detail and ornament is of course well known.

There is rather a tendency among dramatists and dramatic critics to regard historical accuracy as of little consequence in scenes of this kind, provided that a generally good scenic effect is obtained ; and this no doubt is all that the general playgoer cares for ; but it must be remembered that the number of those who take an intelligent interest in archæology is increasing, and that the most cultivated portion of a theatrical audience are not now so easily satisfied as formerly in regard to these matters. And even were it not so, it is worth while to have the scenic setting correctly carried out as a matter of artistic feeling, as well as for the air of greater realism which is imparted to the scene, even without the spectator knowing why. Something which resembles the actual architecture of the site and period, as far as is known, is likely at all events to look more real than details merely produced out of the scene-painter's imagination.

In this respect the manner in which "Julius Cæsar" has been placed on the stage merits recognition. It is the best thing of the kind that has been done at a London theatre for a long time past ; perhaps, architecturally speaking, it is the best in this sense that any London theatre has produced.

The first scene, "a Public place," is not identified with any special site ; it is very effectively arranged, the spectator looking into the scene under the shadow of a large arch with a coffered soffit. The long building seen at the back, with two stories of engaged columns, and arches between them, and a statue in the centre of each arch, reminds one of Mr. Tadema's restoration of the Colosseum in his Academy picture of two years ago, and hence rather suggested an anachronism ; it looks somewhat like a part of the Colosseum "on Mercator's projection," rolled out flat. We shall see, however, that there is authority for an erection of this kind in another situation ; nevertheless, this is the only building shown in the scenes which has somewhat the appearance of being mere stage architecture put in to make a background, and not suggesting to one what kind of building it is meant to be. The second scene, "Brutus' Orchard," is charming in effect, and at once suggests the hand of Mr. Tadema, who must, we should think, have sketched the complete scene. We look from out a portico with two red marble columns which cross the picture, into a mass of trees above which rises a precipitous bank or cliff beyond the ridge of which is seen the upper portion of a temple. A characteristically designed seat, on a curved plan, is conspicuous in the foreground. The whole is a charming picture with a completely antique air about it.

"Cæsar's House" seems, as to general idea, to be somewhat suggested by Mr. Poynter's picture which will be remembered at the Academy some years ago, but there is a great deal more decorative detail shown, giving a

rich effect of colour perhaps a little out of keeping with the general idea of Rome before the Empire; but on the other hand it is reasonable to suppose that Cæsar may have made a special expenditure and show in his own house, in keeping with his ambitious programme. There is a little defect in perspective in the treatment of the right-hand wall of the interior, the lines of the upper portion not coinciding with those of the lower portion. We may pass over without special remark scenes 4 and 5, the "Public Street" and the "Senate House"; as to the latter, we are so totally without data for the interior restoration of the Senate House that, provided only the details are such as might occur in Roman architecture and decoration, every one may have his own idea. The employment of the well-known Roman mosaic ornament, representing cubes in perspective, upon the upper portion of the walls, seems rather doubtful; it is a bad ornament any way, but seems at all events more like one for a floor than for a wall.

The scene for the second act, "The Forum," is the one on which the greatest care has been bestowed, and in which we can really follow the actual lines of the site and of the ancient buildings. At the right hand of the stage is seen part of the rostra, from which Antony is to speak; the spectator is at the north corner of the Forum, and looks across obliquely to where the raking walls of the Clivus Capitolinus are seen, and below them in the angle the row of columns before the shrines of the *Dii consentes*, not, as they now remain, slender Corinthian columns, but the shorter and more sturdy columns of an earlier age. On the right rises the mass of the Tabularium, treated much like the background building mentioned in the first scene, two tiers of engaged columns and arches between them. The lower tier of these arches, or part of it, actually exists behind Michelangelo's masonry, and one of them has been uncovered in recent times; so that here we are on a pretty firm footing; and Middleton quotes Poggio to the effect that, in his day, a second story existed above the lower one. The openings of the arches are occupied by statues, an arrangement which looks a little too rich and ornate for the period; but otherwise this building justifies itself as a probable rendering of this portion of the surroundings; the building looks real here, although the same architectural treatment, spread out as a background to Scene I., looks unreal and "stagey."* On the left of the scene rise timber-built booths or shops in two stories; this again is historical, these are the *Tabernæ veteres*, on the site afterwards occupied by the Basilica Julia. The temple which shows its front beyond the Tabularium is imaginary, or at least not to be identified with anything historically known; but otherwise the scene is really to a great extent a restoration.

The reality of impression conveyed by the structure of the scene is carried still further by the admirable drilling of the crowd of personages who fill the stage and represent the common people of Rome assembled to hear the speeches. The result shows what can be done in the way of realism by good stage management and intelligent "supers." The crowd is a real living crowd, swayed to movement and comment by every point in the speech; there is all the noise and movement and excitement of an actual crowd; and when the line, "there's not a nobler man in Rome than Antony," is shouted out by someone in the upper balcony of the shops, at the top of his voice, as if determined to make himself heard above the noise, one gets quite a feeling of illusion—of being present at a real and not an acted scene.

One must also recognise the admirably effective manner in which the ghost is managed in the scene in the tent of Brutus. As to the battle, battles are impossible on the stage; the best has been done that could be, perhaps, by making the foreground a kind of ravine, where the leaders can speechify each other, and from which the troops can be seen passing, and the noise of the battle can be heard. It might be possible to produce a realistic battle effect on the stage, but it would involve more expense and trouble than the result would be worth.

But as a whole this is an admirable effort in the way of scenic effect and stage management, and is worth seeing on that account alone. Dramatic criticism in the usual sense is not properly within our limits, but one cannot leave the subject without a word as to acting. Mr. Tree's "Antony" is very carefully studied, and his delivery of the famous speech fine and effective; all the more so from the support it gets from the trained acting of the crowd; as a piece of oratorical effect, however, it does nor rise to genius; there are passages in the speech where one could fancy a far greater effect being given to the words. Mr. Fulton, who makes up as Cæsar with a striking resemblance to the original, is successful in producing the impression of a strong and masterful personality, the sort of person who, as Cicero said after meeting him at dinner, made himself agreeable enough, but was hardly the sort of guest you would clap on the shoulder and say, "Well, old fellow, look in again any time you're inclined." Mrs. Tree gives interest and individuality to the small part of the boy Lucius, though it would be impossible, at some points, to take her action for that of a boy; and one of the best acted bits in the play is Mr. Calvert's rendering of that dry and *blasé* gentleman, Casca, in the first scene.

As one matter of detail, are not the swords used by the conspirators somewhat improbable? If they are intended to represent the characteristic short and broad Roman battle sword, they seem hardly wide enough. But would not the conspirators rather have used some kind of short dagger, more easy to conceal in the cloak than these comparatively long weapons?

* It may be that this first scene was meant to be looking up the Forum and seeing the Tabularium at the upper end, but then the building in that case shows no indication of the hill behind it, against which it was backed, so to speak.

CONDITION OF BOW CHURCH.

THE following reports on the condition of this church may be of interest at the present moment. The first is the report of Messrs. Walter A. Hills & Son, architects, made rather more than a year ago; the second is the report, dated two days later, of Sir Arthur Blomfield & Sons, who were called in as consulting architects:—

"147, Bow-road, London, October 21, 1896.

GENTLEMEN,—In accordance with your instructions we have examined the fabric of the chancel, and beg to report as follows:—

The roof is in a very dilapidated condition, the tile lathing being completely perished; the heavy oak timbers are mostly (but not all) worm-eaten and rotten. There are evidences that a partial failure of the roof occurred at some remote date, and that the main tie was spliced, and the other timbers strengthened with iron ties.

The walls of the chancel contain many loose stones, which must fall at no very distant date.

The masonry is thoroughly rotten, and the apex of the gable is much out of plumb.

The panels of the ceiling of the chancel are merely thin boards.

Large portions of the tiles have recently been dislodged; should the next dislodgment fall inside the roof the boarded ceiling would not stop the débris from being precipitated on the chancel floor. It would be of very little use to strip the roof and relay the tiles, as most of the timbers are rotten; we, therefore, beg to recommend that the weather be kept out with tarpaulins, and the chancel closed until the fabric be rebuilt. We should, however, be glad to communicate with your consulting architect before any steps be taken (except the provision of tarpaulins).—We are, gentlemen, yours faithfully,

WALTER A. HILLS & SON.

To the Rector and Churchwardens,
St. Mary, Stratford, Bow.

"6, Montagu-place, Montagu Square, W.,
October 23, 1896."

Re Bow Church.

DEAR SIRS,—We write to confirm the decisions arrived at to-day at our consultation with yourselves at the above church. We are of opinion that the usual Sunday services may be held this Sunday, the 25th, with perfect safety if the weather continue fine and calm.

We consider, however, that the walls of the chancel are in a dangerously decayed condition as regards the external facing of stone, which is about 9 in. thick, and that it will be necessary to rebuild them entirely, as the decay externally is still proceeding; and we consider that no expedient short of this is to be recommended.

We quite concur in the opinion expressed in your report, dated October 21, with reference to the roof.—We are, dear sirs, faithfully yours,

ARTHUR W. BLOMFIELD & SONS.

To Messrs. Walter A. Hills & Son, 147, Bow-road, E."

ST. MARY'S CATHEDRAL MISSION BUILDINGS, DALRY, EDINBURGH.—This building is now in course of erection in Caledonian-crescent. Mr. Henry F. Kerr is the architect.

ARCHITECTURAL SOCIETIES.

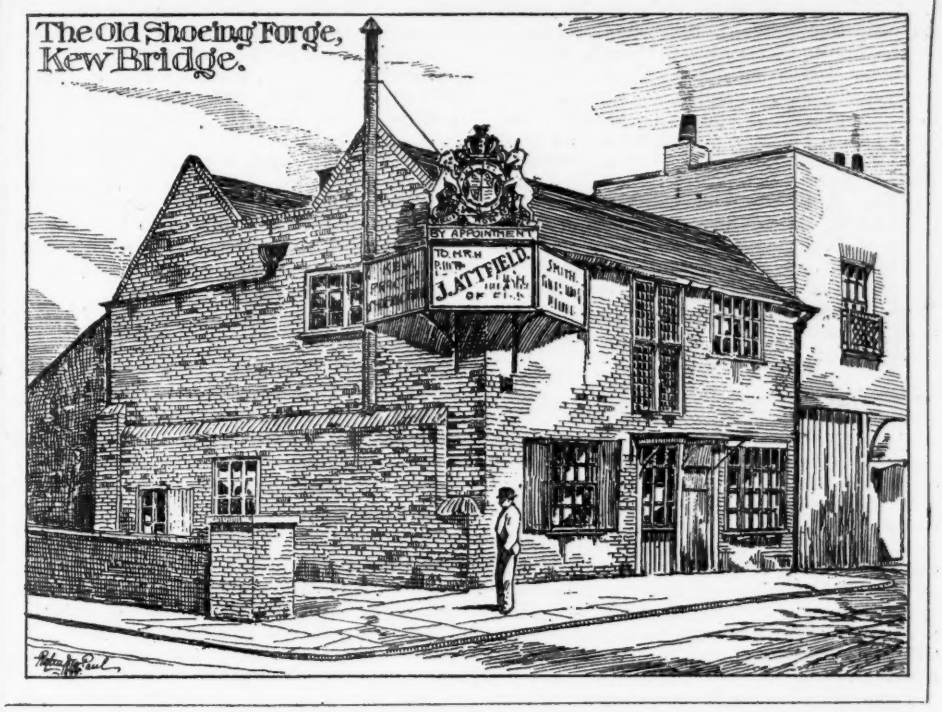
ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The seventh meeting of the present session was held at 56, Great Marlborough-street, on the 26th ult., Mr. H. J. Leaning, vice-Chairman of the Section, occupying the chair. The paper of the evening was entitled "Architectural Commission, Who Receives It," by Mr. Ernest Herbert. It was an attempt to define the relations existing between the public and architects, and dealt with the customs which govern their remuneration, the reasons why they are employed, and the causes which lead to their work being taken up by persons outside the profession. If, he said, the architect held the position which, by virtue of his attainments, he should do in these days of building activity, he should be a respected, famous, and prosperous man, whereas he was, generally speaking, unknown, unappreciated, regarded with suspicion, and somewhat out at elbows. The public had got the idea that 5 per cent. on the estimate should be a maximum charge for architectural work, but for small works this was barely remunerative. The architect was often paid, for more onerous work, at a lower rate than the auctioneer and surveyor; for instance, with regard to dilapidations, the Royal Institute of British Architects fixed a charge of 5 per cent. with a minimum of two guineas, while the Surveyor's Institution, the society of Auctioneers, and the Committee of the Estate Exchange, fixed the minimum at five guineas. The client was guided in his selection of an architect, firstly, but too rarely, by the gauge of merit; secondly, by a monetary standard, which made him unwilling to entrust a man with a 10,000*l.* job who had never done anything more than a 500*l.* one. The feeling of distrust which the public had for the architect was mainly as to his efficiency to deal with a large sum of money, quite apart from his merits as an architect. Deserving men were often debarred from winning competitions by the discreditable action of competitors who brought influence to bear on the committee of selection in favour of a particular style, and by obtaining information withheld from the other competitors. The profession ought also to set its face against the practice of some architects employing men outside their office to prepare showy designs which they passed off as their own. Mr. Herbert then proceeded to describe the various people who absorbed work which would otherwise probably fall to the lot of the architect to carry out. The official architect was a rarity in this country, and when he was appointed the necessary qualities of an architect were generally recognised. The "middleman" was a dominant factor; the freeholder's surveyor, the quantity surveyor, the auctioneer and estate agent, who had better opportunities than the architect of influencing the public, often had the disposal of his work and did not scruple to take a share of his commission. The commercial architects were another class—those who took up the profession merely as a means of livelihood and who employed draughtsmen to produce their designs. Many of our provincial towns did not possess a resident architect, such work as was done by the local men, calling themselves architects, was the product of their inefficiency, aided by the efforts of some unfortunate architectural assistant who covered up with meaningless ornament the inanimate designs of his master. He then alluded to the architectural work carried out by borough surveyors and engineers, and referred to the recent action of the Institute of Architects of Ireland in protesting against the "practice of appointing as a nominal architect any person with whom it is proved necessary to associate a qualified architect in order to ensure the preparation of proper plans, &c." He concluded by suggesting that the useful work of the Association in training architects should be extended, and a Union, comprised of architects who design, and qualified assistants, might be formed, who could, if they wished, organise a strike against the incompetent architect. In summing up the discussion which followed, the Chairman alluded to the custom prevailing in Germany and Austria, where the builder employed the architect, surveyor, and workmen, and the architect was but a salaried officer.—The next meeting will be held on the 23rd inst., when Mr. P. L. Marks will read a paper entitled "Correct Principles of House Planning."

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A dinner in commemoration of the twenty-first anniversary of the founding of the

Leeds and Yorkshire Architectural Society was held at the "Queen's Hotel," Leeds, on Monday. Mr. George Corson (President of the Society) was in the chair, and amongst those present were the Lord Mayor (Alderman Tetley), Mr. W. S. Braithwaite (Vice-President), Mr. W. M. Fawcett (Vice-President of the Royal Institute of British Architects), Mr. W. B. Woodhead (President of the Bradford Society of Architects), Mr. E. Matheson (President of the Leeds Chamber of Commerce), Mr. A. T. Walker (President of the Association of Yorkshire Students, Institution of Civil Engineers), Mr. John Ely (President of the Manchester Society of Architects), Mr. G. Benson (President of the York Architectural Society), and others. After the loyal toasts had been honoured, "The Lord Mayor and City Council" was proposed by Mr. W. H. Thorp, who remarked that the architects as professional men would do their best to beautify the streets of Leeds. The people in many parts of the city had squalid surroundings. He hoped that before very long this evil would be remedied. He expressed a hope that the scheme for making a suburban railway might be carried out.—The Lord Mayor, in responding, said that there was plenty of work for the City Council to look forward to. One of the things upon which the Council would be most congratulated, if they accomplished it, was the making of streets direct from the centre to the outskirts of the city. If architects would spend a few hours from time to time in sketching a plan for making direct communication between various parts of the city, they would be doing a work almost of charity. There were means of communication in some directions, but the city sorely required cross streets. If architects could only devise a system of boulevards and broad streets in the centre of the city, he was sure it would be greatly valued by the City Council. He drew a comparison between the cities of Buda-Pesth and Berlin. In the former, before 1870, the death rate was forty-five per 1,000. After the war of 1866 the municipality and the architects of the city set to work, made fine streets, which went right through the most important parts of the town, and then cross streets. The result was that places which were formerly nests of fever were turned into salubrious parts. Now the death rate of the city was only twenty-four per 1,000. The reduction was simply due to there being more light and air and a better water supply. Compare this with Berlin, which was generally considered a much more forward city. In Berlin, where there were tenement houses, ten years ago there was one district, with a population of 73,000, in which the mortality was no less than 163 per 1,000. Nearly half the deaths in Berlin were attributable to the conditions under which the families in tenement houses lived. Although in Buda-Pesth 60 per cent. of the inhabitants were living in one-roomed houses, owing to the fact that most of them were one-storied dwellings, the death rate was never more than between forty and fifty per 1,000. Therefore the system of small, low, back-to-back houses was not in every way to be condemned, and had a great advantage over tenement houses in crowded cities, inadequately supplied with light and air. Much as they might despise and wish to do away with back-to-back houses, there was something to be said for them. Leeds must look to the architects to assist, not only in arranging the streets, but, if possible, in raising the standard of beauty and proportion to something like that of Paris, which was so much admired. The first thing to be done was to make the streets sufficiently wide, and insist that the houses put up should be of a certain height. In walking through Regent-street, in London, no one could fail to notice the proportion between the heights of the buildings and the breadth of the streets. In Paris the regulations with regard to the height of the houses were very stringent. The buildings there must be in harmony with the streets. If the architects of Leeds could induce Mr. Batley and his colleagues on the Building Clauses Committee of the City Council to form a scheme which would secure that buildings of one kind were erected in one street, and buildings of another kind in another street, Leeds, in the future, might be admired not only for its commercial enterprise, but also for its beauty. If these regulations could be enforced by nations which we looked upon as "mere stuffy foreigners," surely Leeds ought to be able to do something for the improvement of the city, and the conditions under which the people live.—Mr. E. Wilson then gave "The Royal Institute of British Architects and Allied Societies." — Mr. W. M. Fawcett, in responding, referred, amongst other matters, to the Institute examinations, which were having a very beneficial effect. Mr. John Ely also responded.—In proposing "The President, and the Leeds and Yorkshire Architectural Society," Alderman Gordon said that the present generation of architects had done much for the city. Architects were scoffed at for increasing their estimates, but he was sure that the fault lay with the employers who had weak purposes and no knowledge of the subject. He acknowledged how much the architects had done for City-square. Architects in Leeds had not the same chance as in some other cities. The atmosphere, for one thing, was against them. There was something more than beauty of form to be considered in architecture; there was beauty of colour. In Leeds, the beauty of colour could not stand against the attacks of the atmosphere; but some of the buildings of the city—notably the Town Hall—showed that a true and beautiful form would dwell long after the building had been blackened by soot.—The Chairman, who responded, said that if the Corporation had begun many of the improvements which were now being carried out twenty or thirty years ago, it would have been much to the advantage of the ratepayers. Thirty years ago, the Council intended to widen and improve Lands-lane, but this was only being done at the present time. If the improvement had been carried out when the proposal was first made, the work would have been done at one-third of the cost at which it was now being done. Referring to the congested districts in the east end of Leeds, the Chairman suggested that suburban villages might be made for the working classes.—Mr. H. Perkin proposed "Art, Science, and Literature." The toast was responded to by Mr. M. C. W. Flower. Mr. A. T. Walker and Dr. Bodington also responded.

GLASGOW ARCHITECTURAL ASSOCIATION.—At the usual monthly meeting of this Association —the President, Mr. W. T. Conner, in the chair —Mr. Wm. Brooks Sayers delivered a lecture entitled, "Electric Light, Heat, and Power—their Efficient Installation and Cost." The lecturer opened his subject by drawing a picture of what electricity could do to lighten the burden of existence. With electric light, heat, and power we would have no smoke, filth, or suffocating fogs, thus leaving everything fresh and clean without and within; we could pave our streets with asphalte, over which the rubber-tyred motor vehicles would skim noiselessly. A descent, however, to the practical showed that much progress had yet to be made, which Mr. Sayers demonstrated by tables and figures, comparing the cost of electricity, gas, and water, supplemented by a description of the different systems and apparatus for electric lighting, illustrated by examples.

REOPENING OF BEBINGTON PARISH CHURCH.—This building has just been reopened after restoration. The work has been carried out under the supervision of Mr. Charles Deacon, Rock Ferry.



THE OLD SHOEING FORGE, KEW BRIDGE.

THIS building stands on the north side of the Green, close to the southern end of Kew Bridge. It will doubtless be swept away when the bridge itself is rebuilt, and although, perhaps, of no great architectural beauty, it is of interest as a picturesque feature of the Green which might be destroyed at any time to make way for the new work. The window over the porch retains its old leaded lights and solid frame, and is probably, with the porch itself and the small bay window adjoining, original. The other windows are later, perhaps, in date. At the angle is an excellent example of the Royal Arms.

SURVEYORS' INSTITUTION: STUDENTS' PRELIMINARY EXAMINATION.

OF the candidates who presented themselves at the preliminary examination of this Institution, held concurrently in London, Manchester, and Dublin, on the 19th and 20th ult., the following satisfied the examiners:—

R. W. Alderson, Cirencester; F. T. Allen, Lewisham; C. E. Amoore, Brixton; A. L. Berry, South Croydon; E. W. Booth, Ilkley; C. G. Bradley, Wolverhampton; T. Brent, Shooters Hill, Kent; H. Brooker, Steyning; E. M. Browne, Kingsthorpe; G. J. Bruzaud, Addleston; A. E. Buckley, Halifax; W. Burman, Kiveton Park, Sheffield; T. L. Caton, Brixton; C. V. Chilwell, London; R. Cobb, Higham, Rochester; A. G. S. Cooke, Ashbourne; G. F. Cotching, Horsham; A. H. Dallschaft, London; T. Dann, Gravesend; W. J. Dixson, Welwyn; C. H. Donne, Leek Wootton; J. W. Earle, Woolton; C. W. Eastwood, Malton; C. J. Elgar, Wingham; H. Etlinger, Dublin; F. Fletcher, Whetstone; W. Foster, Hampton Hill; W. Fox, Bournemouth; C. G. French, East Finchley; K. G. Gairdner, Highgate; A. Gimson, London; E. B. Glasier, Wimbledon Park; J. C. Goff, Aspatria, Carlisle; F. A. S. Goodbody, Birmingham; A. Goodman, Clapton Common; R. G. Gurney, Aylesbury; C. A. Hall, London; G. Harding, London; C. P. Harrison, Caerhowel; E. Harrison, Bolton-le-Sands; S. W. Hider, Upper Tollington Park; E. C. Hill-Whitson, Lytham; J. H. Hinchcliff, Leeds; M. A. Hindmarsh, Alnwick; R. T. Hodge, Wimbledon; C. J. Hudson, Bridlington Quay; A. C. Hughes, Birmingham; H. Hunt, London; P. Huributt, Downton; C. W. Ingram, Lewes; F. Johnson, Erith; A. B. Jones,* Kew; H. D. Kelleway, Cambridge; P. R. Kemp, Preston; F. C. Knibb, Wandsworth-common; H. Lisney, Sydenham; C. Living, jun., Plaistow; P. J. May, Brighton; T. J. Mercer, Coventry; H. A. Mitchell, Brighton; C. E. J. Monson, Newark-on-Trent; C. P. Moss, Crouch-hill; A. E. Oaten, Bristol; H. E. Perks, Bedford; G. L. Pottier, Walthamstow; C. E. Rawlins, Liverpool; H. T. Richardson, Lee; H. H. Riddle, Tooting; G.

* Passed at head of list.

C. Rowe, Sutton; W. J. Shaw, Leeds; L. E. Shone, Whitchurch; J. H. Simpson, Bicester; W. J. Slipper, Chelmsford; C. H. Smith, Calne; Q. C. Smith, Muswell Hill; H. Soper, Brighton; F. E. Spalding, Hampstead; P. A. Stanley, Burton-on-Trent; F. E. Strudwick, Bromley; G. D. Sweetman, Ryde; H. J. Tilley, Watlington; J. R. Tonson-Rye, Aspatria, Carlisle; E. D. Tredinnick, Craven Arms, Shropshire; J. T. Turner, Dalston; R. P. Vale, Hartlebury: C. H. Vince, Halton; G. D. Wadham, Dalton-in-Furness; G. R. Walker, Long Ashton; L. M. Walton, Bexley; W. H. J. Weston, Ashford; F. W. Wheeler, Fulham-road; L. E. Wilson, Lincoln; W. A. Wiltshire, Reigate; L. Wragg, Loxley; K. J. Young, Brixton.

THE HASKIN METHOD OF PRESERVING TIMBER.

AN interesting demonstration of the process of preserving timber, as developed by an American engineer, Colonel Haskin, was given to members of the Press by the Haskin Wood Vulcanising Company, Limited, at Samuda's Old Shipbuilding Yard, at Millwall, on Thursday, January 27 last. The works are by no means of an experimental character, the buildings and machinery erected being thoroughly substantial and capable of dealing with immense quantities of wood.

The process consists in subjecting the raw, unseasoned wood in long cylindrical chambers to the action of compressed, circulating air, heated to a temperature considerably above the boiling point of water. After being thus treated for a number of hours, the wood is allowed to cool down in air under the same state of compression. It is claimed that after this treatment the wood is strengthened, hardened, improved in appearance, more impervious to water, and, above all, is rendered far less subject to decay.

The beneficial effects of wood creosote in the preservation of timber are well understood, but when that substance is applied it is always done outwardly, and the creosote soaks in as far as it may. In the Haskin process the products of distillation are antiseptic and closely resemble, if they are not practically identical with, those produced by creosoting. Therefore, this process may be said to retain the creosote in the wood, in the main, and the products of distillation of the balk of timber themselves lead to its own preservation. No additional creosote is employed, nor indeed anything but air under great pressure and high temperature. The essence of the process consists in not permitting this destructive distillation to go too far, else the timber would become brittle, and be rendered useless for practical purposes. The inventor appears to have succeeded in developing these antiseptics in such a manner as that they do not migrate far within the wood from the spot where they are generated. As before mentioned, some portion undoubtedly escapes, the surfaces of treated blocks bearing evidence of the fact; in this connexion it would be interesting to have analyses of the air withdrawn from the cylinders.

Owing to the high atmospheric pressure under which the wood is heated, the water of the sap is not converted into steam, and ebullition does not occur within the pores of the wood. It is stated that appreciable quantities of phenols and terpenes—long known as preservatives—are formed, and the albumen coagulated, by the reactions which occur, and that the oily matter formed fills the pores and saturates the fibre of the wood.

The whole process is remarkably simple, and should time corroborate the statements as to the effects produced, the inventor is to be congratulated upon having made a most valuable discovery; but there is a certain vagueness and meagreness of detail in the description of the process with which we have been favoured. Thus, it is said that, "the great value of the process is due to its fixing this 55 per cent. of fluid matter (wood sap) within the wood in condition so that it cannot ferment or vegetate; neither is it liable to dissolve or wash out, but is evenly distributed, filling the wood cells and ducts, debarring entrance to moisture or germs of decay." Now a great part of this 55 per cent. of fluid matter is uncombined water, and we should like fuller information as to the manner in which it is fixed, so that it cannot evaporate. We can understand that through coagulation of the albumen and formation of antiseptic compounds, the process may be very valuable, but surely these do not *fix* all the free water.

Again, according to tests made by Trautwein, the modulus of rupture of transverse stress was increased 21 per cent., and according to Thurston only 8¼ per cent. Why this discrepancy? Is it due to difference in the variety of wood treated and tested? Surely it is strange that if pitch pine is increased 21 per cent. the yellow pine, apparently tested by Thurston, should be increased in strength only 8¼ per cent. It is worthy of note that, according to Trautwein's tests, the compression strength of pitch pine is increased from 5,900 lb. to 7,294 lb., or, in other words, to that of English oak.

In regard to the machinery, a few words will suffice to explain it, there being nothing of a very complicated nature. Three Galloway boilers, capable of working at a pressure of 200 lb. per square inch, provide all the steam required. There are two air-compressors and two circulators for keeping the compressed air in motion in the cylinders. But before reaching the cylinders the air is first of all deprived of its moisture, as far as possible, and is then pumped by the circulator through tubes heated by live steam, and afterwards through pipes heated by coke fires. By this process the compressed air is heated to about 400 deg. Fah., and is then passed on to the cylinder or cylinders in which the wood to be treated has been placed. These cylinders, four in number, are 113 ft. in length, have a diameter of 6 ft. 7 in., and each is capable of treating 1,400 ft. of timber. Each is closed by a curiously constructed door or lid, which lifts upwards, being counterpoised by weights and controlled by a hand wheel. The closing bars are shot simultaneously into slots by one operation actuated from the centre of each door. The timber to be treated is landed on a wharf close by, placed on trollies, and run direct on rails into the cylinders.

The whole preserving process takes from six to seven hours to perform, and prior to withdrawal from the cylinders the temperature and pressure are, of course, gradually slowed down.

Obviously, it was impossible in the course of one day to demonstrate the applicability of the Haskin method to all of the principal kinds of wood, but we were shown several samples, and were assured that any class of wood could be satisfactorily treated. We had hoped to have received some samples to aid us in forming an opinion of the value of the process, by a close micro-examination. These would doubtless have enabled us to state as to where and how far the distillation in the treated wood had gone on. Failing these, we cannot give such a decided opinion as might otherwise have been the case; but we have no hesitation in saying that there is a great future for "Haskinised wood." We see no reason why, in many respects, it should not take the place of wood seasoned by ordinary natural processes, and it has already usurped the place of much ordinarily creosoted wood in the United States. This method should have considerable effect on the price of seasoned timber; no storage for years is requisite, and there is, consequently, considerable saving in rent and loss of capital, and the material seems at least quite as durable. Green wood may be treated, and is, in fact, preferred.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Dr. Collins (Chairman) presiding.

Loan.—On the recommendation of the Finance Committee, it was agreed to lend the Managers of the Poplar and Stepney Sick Asylum District 5,800*l.* for alterations and additions to Bromley Asylum.

Conditions of Contract.—The General Purposes Committee brought up the following report:—

"In our report to the Council on November 30, we referred to a letter from the Institute of Builders on the question of amending the standing orders relating to the conditions of building contracts. A copy of the report of the Committee and resolutions of the Council were forwarded to the Institute, and the following reply has been received, which we report for the information of the Council:—31 and 33, Bedford-street, Strand, W.C., London, January 11, 1898. Sir,—Your letter of the 20th ultimo with enclosures was laid before my council on the 4th instant, and I was directed to thank you for it, and to acknowledge that the proposed modifications are satisfactory so far as they go, though they leave the conditions still very onerous and stringent. The proposed arbitration clause would be more acceptable if modifications were made in several of the other clauses, which in their present form do not come within the operation of the provisions of the arbitration clause. The contract form might be much more concise, and there is in it so much that gives a possibility of petty disputes that it is doubtful whether builders who can find sufficient work in other directions will trouble to compete under such conditions. The Council would be much better served were they only to invite selected builders, and adopt a simple form of contract, the provisions of which London builders are conversant with from constant use. The whole of the stipulations in regard to securing that contractors shall pay the standard rate of wages and observe the customary hours of working is altogether unnecessary, as it would be quite impossible for a contractor to carry on his business unless he conformed to the agreements in all these respects. The introduction of such clauses into contracts accentuates the difficulties which large employers of labour necessarily experience in the conduct of their businesses.—I am, Sir, your obedient servant, R. S. HENSHAW, *Secretary*. To the Clerk of the London County Council, Spring-gardens, S.W."

Taxation of Ground Values.—The Council then discussed at length the question of the taxation of ground values. On December 7 it was resolved:—

(*a*) That it is advisable that a new source of revenue should be obtained by means of some direct charge upon owners of site values.

The following were the next recommendations of the Local Government and Taxation Committee:—

(*b*) That this charge be termed "owners' tax."

(*c*) That all persons deriving a revenue, or use equivalent to a revenue, from the value of a site, be liable to pay such charge.

(*d*) That the site value of every property be assessed and entered in the valuation list.

(*e*) That the site value be the annual rent which at the time of valuation might reasonably be obtained for the land as a cleared site if let for building by an owner in fee, subject to equitable reduction in exceptional cases in which the full site value thus defined is not being enjoyed or obtained by any person or persons.

(*f*) That in view of the fact that considerable expenditure has been incurred from public funds which has largely contributed to the increase of site value, the Royal Commission be asked to recommend that such owners' tax commence at the rate of 6*d.* in the pound per annum, and rise gradually to such sum as Parliament may determine, and that any increase of burden or expenditure for new services should be equitably shared between the present rate on occupiers and the proposed owners tax.

(*g*) That any existing or future contract or agreement by which an owner purports to exempt himself from the owners' tax, or to cause it to be paid by any other person in his stead, be invalid.

(*h*) That vacant land and empty property shall be liable to pay the owner's tax upon the site value as appearing in the valuation list.

(*i*) That the Royal Commission on Local Taxation should also be informed that the Council is in favour of a municipal death duty upon immovable property held by individuals within the county with an analogous charge on such property when it is vested in bodies corporate or unincorporate.

Recommendations *b* to *g* inclusive having been agreed to after a long discussion,

Sir H. Poland, on *h*, pointed to the case of pleasure grounds of private owners as one which made the suggestion ridiculous. It was an attempt to penalise owners who did not cut up their land into building sites. He supposed, in the case of the Temple Gardens, the Benchers would be let off because for a few months they let ragged children play in their grounds. But such gardens as those of Holland House, or in Belgrave-square and elsewhere, would be taxed in such a fashion as enormously to increase their cost. It was difficult to sit quietly in the Council and submit to such nonsense as that.

Mr. Costelloe said the Progressives felt that the system of putting the whole of the taxes on rateable value was wrong, and they had the courage of their convictions. So long as people kept open spaces in London for their own benefit, maintaining for themselves a lordly background, then they should pay the full value upon it.

The Progressives called for a division, although the Chairman declared the recommendation carried. There voted for the recommendation 56, against 48.

On recommendation *(i)* Mr. Alderman Beachcroft moved, "That the recommendation be referred back to the Committee with an instruction to consider and report whether, in lieu of informing the Royal Commission that the Council is in favour of a Municipal Death Duty, it would not be preferable to suggest that

a certain share of the Estate Duty now levied on London property should be allocated to London local taxation."

Mr. Fletcher seconded the amendment, which was agreed to.

A further amendment by Mr. Cornwall, omitting all in the amended resolution from the word "that," down to the second word "that," was opposed by Mr. Beachcroft. It was, however, carried.

Mr. M'Kinnon Wood moved the adjournment of the debate on other recommendations of the same committee, which was agreed to.

Protection from Fire in London.—Colonel Rotton moved the reception of a long report of the Fire Brigade Committee. The Committee recommended:—"That the estimate of 197,185*l.*, submitted by the Finance Committee in respect of the provision of additional protection from fire in London be approved." The report narrated what had taken place since the Council came into existence in connexion with the question of improving the means of protection from fire in London, and contained the following statements:—

"The distinguishing feature of the scheme of 1894 may be said to be the stationing principally in the suburban districts of men with appliances sufficient for saving life, and holding in check if not altogether dealing with any small outbreak, *but who would never be called away to any great distance from their respective stations.* In other words, their effective sphere of action would be a radius of, say, a quarter of a mile from the point where they were on duty. The distinguishing features of the present chief officer's proposal are (1) distribution of the men in small stations (at each of which horses shall be kept) from which they may in case of need be drawn, and concentrated wherever required; (2) dispensing with certain existing street duties within a radius of, say, three-quarters of a mile from a station at which there is a fire-escape capable of being drawn by horses; and (3) keeping two pairs of horses at every station at which a steam fire-engine, as well as a horsed escape, is kept. It will be seen that the principal difference between the two schemes is the character of the sub-stations, but, after careful consideration, we agree with the opinion of the present chief officer that sub-stations with two or three men who are without means of proceeding quickly with suitable appliances to a distance of more than a quarter of a mile do not provide the best means of protection. It is true that within a short radius of such a station the protection afforded may be all that is required, but just beyond that radius the inhabitants are practically little if any better off than if they were a mile from a station at which there is a fire-escape drawn by horses. We may mention that at present only three sub-stations have been established, namely, at North End, Fulham, Lee Green, and Battersea Park-road. As regards the second feature of the new proposals, we may state that when the Committee submitted the 1894 scheme the Brigade possessed only one (the original) escape drawn by horses, but the utility of the horsed escape had by that time been so clearly demonstrated that an order had been given for six more of such appliances. Further, it was, of course, foreseen that the extensive adoption of horsed escapes would render it unnecessary to retain many of the existing escapes stationed in the streets; and the chief officer's recommendations in this direction are, therefore, what we anticipated, and they have our full concurrence. The third feature, that of keeping two pairs of horses at stations equipped with steam fire-engines, and horsed escapes is the natural consequence of the adoption of the latter appliance.

It may be interesting and convenient to state here the general principles which, in the opinion of the Chief Officer, should govern fire brigade work in London. They are as follow—(1) It should be practicable to concentrate 100 men under fifteen minutes in any dangerous area for large fire occurrences. (2) On any call the firemen ought, if the machine leaves the station at once, to reach the scene of the fire in less than five minutes. (3) The principle of station work should be this: each station is responsible for a certain area, and on any fire occurrence within that area the station concerned should be prepared at once to use its entire strength, with two or more appliances and reserve stores, if necessary, at that fire, the first supplemental aid coming from the adjacent stations. (4) In order to do this effectively at each station there should be—*First*—Choice of apparatus. *Second*—A good proportion of men on duty at the station. *Third*—Sufficient firemen and a coachman ready clothed to ride at once with the first machine, two horses being also in readiness, so that the first turn-out may be a matter of seconds instead of minutes. (5) A sub-station should have one man at least besides the duty man ready clothed, to assist in horsing the escape, or if necessary, to run the station escape by hand.

Before dealing specifically with localities in which we recommend the establishment of stations, we ask the Council to endorse the principles of the revised scheme. We may mention that we propose that a sub-station shall occupy the same space as a full station, and that the engine-room and stable shall in each case be of exactly the same size. In the event, therefore, of it being hereafter considered desirable to convert a sub-station into a fire-engine station, it will not be necessary to increase the area occupied by the building. It may in such a case be necessary to add a floor to the building, but even this may be obviated by drafting to the station single men. In this connexion we may mention that we propose that in new stations separate quarters shall not be specially provided for single men as has usually been the case. One set of married men's quarters can, if necessary, be utilised for the accommodation of three single men, and two sets would conveniently accommodate six or seven. We recommend—(*b*) That the Council do decide that each fire-engine station shall be equipped with at least a steam fire-engine, a fire-escape drawn by horses, a hose-cart, and a light manual escape, and that the staff of the station shall consist of one officer, nine firemen, and two coachmen, with four horses. (*c*) That the Council do decide that each sub-station shall be equipped with at least a fire-escape, drawn by horses, a hose-cart, and a light manual escape, and that the staff of the station shall consist of one officer, five firemen, and one coachman, with two horses. (*d*) That the Council do approve the principle of dispensing as a rule with fire-escape and hose-cart stations within a radius of about three-quarters of a mile of a station at which there is a fire-escape drawn by horses."

Colonel Rotton, Chairman of the Committee, said when they took over the Fire Brigade a proposal was made by the then Chief Officer (Captain Shaw) to expend 284,000*l.* in building new stations and improving the appliance. Out of that amount they proposed to build thirty-two new stations; but of those only four had been built. Under Captain Simonds they agreed to spend 102,500*l.*, but of that only 15,000*l.* had been spent, and chiefly on sites. Since Commander Wells was appointed as Chief Officer, he had made a series of recommendations from time to time. Before the long vacation last summer, the Committee called upon Commander Wells to put into concrete form the various suggestions he had made, and in September he produced a report, which had been published. The Committee had adopted the scheme now before them, as would be seen by the dates, before the great fire in Cripplegate occurred, so that there could be no idea that that was legislation in a panic. The dates absolutely disproved that. That fire did, however, bring into prominence some of the improvements they had in view. The proposals in the report dealt with additional stations—four full and eighteen sub-stations—and the estimated cost of carrying out those proposals was 197,185*l.*, of which 191,000*l.* was in respect of stations and 6,185*l.* in respect of plant. The maintenance would amount to 23,200*l.* The Council was committed to the building of new stations in substitution of existing stations at Islington, Lewisham, Paddington, and Portland-road. The amount yet to be spent in respect of these might be put down approximately at from 55,000*l.* to 60,000*l.* The Council had already decided to establish additional fire stations at Shepherd's Bush, Perry Vale, and Streatham, and the expenditure yet to be incurred on these three might be put down at 40,000*l.* The Council was also committed to the erection of a building to accommodate the staff of the Battersea River Station, and also to erect a sub-station at Woolwich. The cost of these might be put down at 10,000*l.* In addition to this work it was contemplated to alter several existing stations. The Council was committed to enlarging and altering those at Hampstead, Mile End, and Battersea, and the cost of this work might be put down at 18,000*l.* As regarded other existing stations, no estimate had been prepared. In fact, only a few stations had yet been selected, and it was quite impossible to say what the cost of enlarging them would be. The Fire Brigade Committee proposed, however, to provide in next year's estimate 3,000*l.*, part, if not all, of which would be a charge on rate. The Committee were also recommending the Council to purchase next year for existing stations six steam fire-engines, at a cost of about 2,000*l.*, and to increase the staff of the Brigade by sixty-one firemen, the cost of whom might be put down for maintenance at 4,500*l.* Some of these men might not be required till the autumn. It was also proposed to increase the number of horses hired, but the hiring would be done gradually as fire-escapes and long ladders of the new pattern were delivered. The actual additional expenditure in respect of these horses would next year probably be 4,000*l.* Two fire floats would probably be ordered, at a cost of from 15,000*l.* to 16,000*l.* Part of this would be a capital charge of 10,000*l.*, and 6,000*l.* would be required for maintenance. This made a total of 337,185*l.* charge on capital, and 37,700*l.* on maintenance. The work would occupy at least ten years in execution, but, assuming that the money were all spent at once, the charge for the first year in respect of redemption of capital and payment of interest would be 14,328*l.* 15s., which, with 37,700*l.* on maintenance, would amount to 52,028*l.* 15s., equal to a rate of about a-third of a penny in the pound. His experience of the Council was that in every vote brought before the members for the Fire Brigade they had always treated the matter with the greatest liberality and generosity, and he felt satisfied in his mind that that would be the case on the present occasion, when the money was necessary for a comprehensive scheme to enable the Brigade, owing to the rapid growth of London, to cope with any outbreaks of fire and preventing them from becoming serious.

Lieut.-Colonel Ford complained that the Committee formed too much of a "Cabinet," and should have let the Council know before now the state of the Brigade. Until recently the Chairman of the Committee was quite satisfied with the condition and efficiency of the Brigade, for in evidence he had stated that he believed the London Fire Brigade was the most efficient in the world. It was difficult to reconcile the statements of the Chairman. He moved:—"That the following words be added 'but that it be referred to the Committee to consider and report as to whether the Government should not be approached with the view of utilising to a greater extent than at present the services of the police force in connexion with the extinction of fires; and also whether the money contributions from the fire insurance offices and from the Government ought not to be increased.'" He said the Insurance Companies were growing fat on the splendid security from fire afforded them in London, and yet they only contributed 28,000*l.* The Government only gave 10,000*l.* a year, and since that sum was fixed the public buildings had doubled in value, and yet it was suggested now that even that sum should no longer be paid. He thought there should be more fire alarms, and that the police, as in many provincial towns, should be part of the Brigade.

Mr. Thornton seconded the amendment. Though the personnel of the Brigade was very satisfactory, he did not think the appliances were, and he agreed that we had much to learn from America. He was satisfied that chemical appliances ought to be used.

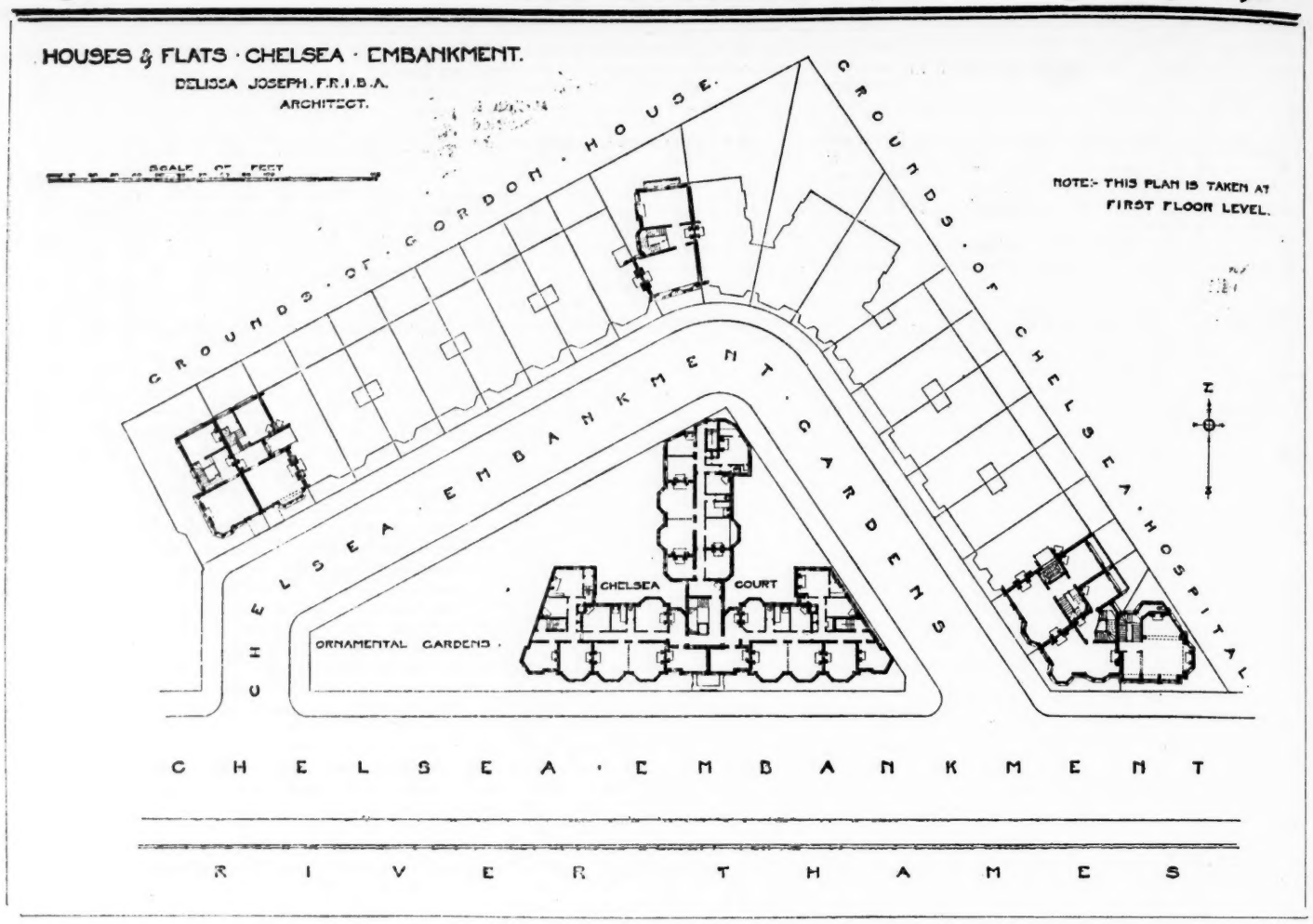
Mr. Urquhart, Vice-Chairman of the Committee, said the new escapes would be the most perfect instrument of the sort, not only in London, but in the world. He hoped they would approve the scheme, which was something like a complete scheme for the protection of London from fire. In regard to chemical engines, the opinion seemed to be that the Brigade could do as well without them for small fires, and that for large fires they would be of little avail.

The debate was, after further discussion, adjourned.

Jobbing Work.—The same Committee also reported as follows:—

"The Council on April 28, 1896, resolved that the jobbing work required at fire brigade stations should be executed at our option by contractors or by the Works Department. Arrangements for insuring compliance with the Council's standing orders with respect to rates of wages and hours of labour in cases in which local tradesmen might be employed having been completed, the new arrangement came into effect on June 1, 1896. We recently instructed the Architect to report what had been the effect of the arrangement during the twelve months ended May 31, 1897. He now reports that during that period the total number of works which had been executed, and the cost of which had been ascertained, was 630, of which 437, estimated by him to cost 2,344*l.* 12s. 5d., were done by the Works Department at an actual cost of 1,926*l.* 14s. 6d., and that the remaining 193, estimated by him to cost 3,307*l.* 11s. 11d., were executed by contractors at an actual cost of 3,141*l.* 4s. 2d. It will thus be seen that the works executed by the Works Department have cost 17 per cent. less than the Architect's estimate, whilst those done by contractors have cost 5·2 per cent. less than his estimate."

Elephant and Castle Estate, Walworth-road.—The Improvements Committee recommended, and it was agreed, that the estimate of 9,550*l.* submitted by the Finance Committee be approved, and that, subject to the Vestry of


HOUSES & FLATS · CHELSEA · EMBANKMENT.
DELISSA JOSEPH. F.R.I.B.A.
ARCHITECT.
SCALE OF FEET
NOTE:- THIS PLAN IS TAKEN AT FIRST FLOOR LEVEL.
GROUNDS · OF · GORDON · HOUSE.
GROUNDS · OF · CHELSEA · HOSPITAL
CHELSEA · EMBANKMENT · GARDENS
CHELSEA COURT
ORNAMENTAL GARDENS
CHELSEA · EMBANKMENT
RIVER THAMES

Newington agreeing to undertake the necessary paving works, the Improvements Committee be authorised to arrange for the acquisition of the land forming the northern and southern frontages of the Elephant and Castle Estate, and for the alteration of the tramway lines in connexion with the widening of the roads, as shown upon the plan approved by the Improvements Committee on January 21, 1898, and that, in the event of the owners being unwilling to sell the land at a reasonable sum, the Vestry of Newington be asked to acquire the property compulsorily under the powers conferred by the Act of 57 Geo. III. cap. 29 (Michael Angelo Taylor's Act), on behalf and at the cost of the Council.

After transacting other business the Council adjourned soon after seven o'clock.

Illustrations.

FLATS AND HOUSES, CHELSEA EMBANKMENT.

THESE flats and houses occupy the site of the Naval Exhibition of 1891, and have taken about three years in erection.

The first contract was for twenty-three houses, and the works were executed by Messrs. J. Allen & Sons, at a cost of 92,000*l*. The second contract was for the block containing eighteen sets of flats, and these were carried out by Mr. H. Lovatt, at a cost of 41,000*l*. The total outlay upon the whole operation thus amounted to about 133,000*l*.

The block plan, published herewith, explains the method in which the land has been laid out so as to obtain the largest amount of frontages, and at the same time to secure to each house and flat an adequate view of the river.

Some difficult planning had to be overcome in the treatment of the three-angle houses; and what is believed to be a new departure has been employed in the general form of the plan of the flats, whereby three suites on each floor are served by a common stairway.

The architect for both flats and houses is Mr. Delissa Joseph.

DRAWINGS OF CLARE COLLEGE.

THE measured drawings of Clare College, as it is called on the drawings (its proper title is Clare Hall), are by Mr. T. Tyrwhitt, and are the set for which the Institute silver medal and ten guineas was awarded last month.

Clare Hall is one of the most interesting buildings of the early English Renaissance, deriving additional effect from its charming situation. The view of it from the bridge behind King's forms one of the most pleasing bits of architectural effect to be seen in Cambridge. A complete set of elevations of the interior court and the principal external façade, with the plan, is therefore of some value as a record and for purposes of study.

The building was commenced in 1638, and the quadrangle appears to have been completed, in the desultory manner in which building was carried on in those days, in about fourteen years. As usual, there is no mention of an architect, and no record as to who even claimed to have made the design; only we know that John Westley was the builder, and Francis Wright the carpenter, and three or four other names are recorded as those of working masons, on daily wages.

The chapel, a portion of which is shown in Mr. Tyrwhitt's drawings, was more than a century later, having been commenced in 1763, from the design of Sir James Burrough, Master of Caius College, on whose death the next year it was put into the hands of James Essex.

Mr. Tyrwhitt, the author of the drawings, writes:—"It may be noticed on the plan that the dividing up of the college rooms, more especially at the south-east corner of the quad, is not as originally designed; the thick walls and fireplaces of course remain, but the partition walls seem to have been moved about from time to time. On the plan also the inconvenient arrangement of having no closets for the undergraduates within the building might be noticed, although this is a common arrangement both at Oxford and Cambridge. In elevation the Gothic character of the window jambs and mullions to the quadrangle and street façades are of interest, also their string courses and sills; mouldings of almost mediæval section often occur.

I hear from the master of the college that the balustrade to this portion is not original: it had probably a plain or battlemented parapet, and although the balustrade seems in keeping with the whole, yet in detail its mouldings are more advanced than the rest, as you may have noticed from the sheet of full-sized profiles. There are some grand wrought-iron gates, both at the entrance from the street and at the back of the college, which I much regret I had not space to show. Internally, there are many details worth notice—the central staircases on north and south sides of quad, that in the master's lodge, the bookshelves in the library, the panelling in the combination room, &c."

DESIGN FOR A SMALL COUNTRY CHURCH.

THIS design, by Mr. Harbottle Reed, is the one to which the Council of the Institute of Architects awarded the Grissell Gold Medal for the present year. The following is Mr. Reed's statement of his aim in working out the design:—

"As the conditions of competition stipulated that the church must be constructed entirely of timber (with shingle roof) an endeavour was made to govern the design by the nature of the material suggested.

Even the stone basement upon which the ancient Norwegian wooden churches stand, and from which they derive a certain air of permanence, was inadmissible, as was the plaster work of our Cheshire examples.

This and the necessary avoidance of stone forms in construction and tracery inevitably tend to render it difficult to impart the appearance of durability which it is desirable that every church, however small, should possess; although this has been partially attained by keeping the timbers of good size.

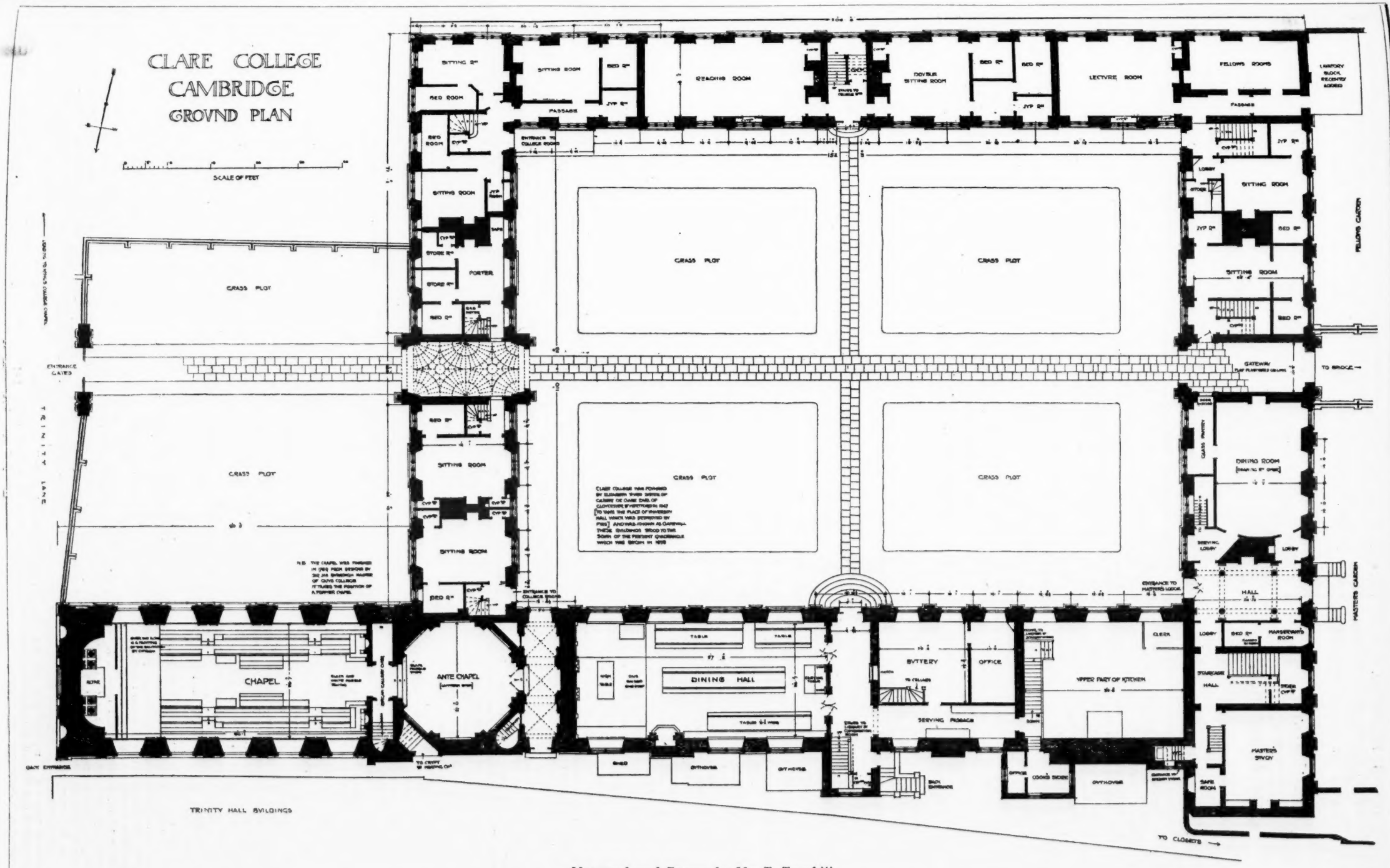
Ample room is afforded for the 200 sittings, and in addition to the usual choir seating a space is provided for an auxiliary choir or orchestra.

To give relief to the interior a range of panels under the cornice would be filled with decorative painting."

The competition for the Grissell Medal was a very good one this year, perhaps because the subject was such an attractive one; and we shall publish shortly two of the other designs submitted.

COMPETITIONS.

WESLEYAN CHAPEL, WESTON-SUPER-MARE.—In a limited competition for a new Wesleyan Chapel to be built at Weston-super-Mare, the designs of Mr. W. J. Morley, of Bradford, were accepted. The design is in the Decorated Gothic style, with tower and spire, and the building is to cost about 5,000*l*.



Measured and Drawn by Mr. T. Tyrwhitt.

BOOKS RECEIVED.

THE CATHEDRAL CHURCH OF LICHFIELD: By A. B. Clifton. (G. Bell & Sons.)

THE CATHEDRAL CHURCH OF WINCHESTER: By P. W. Sergeant. (G. Bell & Sons.)

THE GAS-ENGINEERS POCKET BOOK: By Henry Connor. (Crosby, Lockwood, & Son.)

Correspondence.

To the Editor of THE BUILDER.

THE ENGINEERING STRIKE.

SIR,—Now that this disastrous strike is at an end, although the effects will probably be felt for some considerable time, every one, I take it, in all trades, will be anxious to prevent a similar struggle occurring again. To do so, we ought, if possible, to find out the chief causes which lead to these strikes. One of these causes seems to be that the men, as a rule, only hear one side of the question. Their meetings are addressed solely by men of their own class, who have never had to manage a business; and who are not sufficiently educated to realise the conditions of international competition, under which modern business is carried on. The papers they read are equally one-sided. Would it not be possible to hold periodical meetings of masters and men, at which the masters could explain to them the ultimate effects on the national trade of such policy as deliberately working slowly, and reducing the number of apprentices, which, of course, means increasing the number of unskilled labourers, already too large. When we find that America, where wages are higher than in England, can deliver steel rails more cheaply than we can produce them here, it is evident that our so-called skilled mechanics are very inferior to other nations in the quantity of work they turn out; and if they continue in the same course we shall have no work to do. If the men could have this plainly explained to them by masters, instead of being carefully ignored, we might have less difficulty in future.

GUY M. NICHOLSON.

THE LONDON COUNTY COUNCIL AND COMPULSORY REGISTRATION OF LAND.

SIR,—The Report of the General Purposes Committee of the London County Council issued last week has been a revelation to many who assumed without inquiry that the Land Transfer Act, 1897, would cheapen and simplify the transfer of property. The Council deserves every credit for obtaining the views of bodies and classes interested before deciding on the proposal to experimentally adopt compulsory registration of title in the County of London. It was hardly foreseen, however, that the result would have shown such a decisive consensus of opinion against the proposal.

The Council received in all fifty-seven communications. Of this number only thirteen favour the application of the Act to London, whilst the number against amounts to forty-four. The full significance of these numbers can, however, only be realised when the character of the replies and the bodies sending them are considered.

The replies in favour are confined to twelve Vestries or local bodies and one individual. The forty-four replies against include twenty-one Vestries or local bodies, the Institute of Bankers, the Building Societies Association, the Ecclesiastical Commissioners, the Auctioneers' Institute, seven railway companies (amongst them the London and North-Western, the Midland, the Great Western, and the Great Central), and also eight building and land societies, including the Birkbeck and the British Land Societies, who sent in replies on their own initiative.

The reasons given for the respective decisions come to are almost entirely one-sided. Two only of the Vestries who favour the experiment give a reason for their decision; but the reasons given on the other side are many and various. It would make too great a demand on your space to set the arguments out at length, but the opponents of compulsion are almost unanimous in urging that the proposed system would add seriously to the difficulty, expense, and delay of dealing with property, and that the County of London is not a suitable county for a doubtful experiment, having regard to the vast number of properties that would be affected and the value, complexity, and importance of the interests involved.

The only plea on which a claim to apply compulsion can be founded is that compulsion is called for by and in the interests of the public and of property owners. In the face of the replies sent in to the Council it is hardly conceivable that any member, Moderate or Progressive, would care to incur the responsibility of allowing the Act to come into operation. Londoners will watch with unusual interest the proceedings at the special meeting to be held on February 15. The vital importance of every member being in his place on that day will be understood when it is realised that the Act is so framed that if one-third of the members should for any reason not be present the meeting cannot be held, and in that case compulsory registration of title will take effect in London on July 1 next.

J. S. RUBINSTEIN.

5, Raymond-buildings, Gray's Inn, W.C.

A PROPERTY OWNER'S PARADISE.

SIR,—The village of New Southgate, though only six miles from King's Cross on the main line, is, from the builder's point of view, the most neglected round London, as there has been very little building going on there for the last twelve or fifteen years, never more than one or two houses being built at a time and not often that. Yet, in that time, the population has doubled, and the inhabitants are herded together in an alarming manner. Small cottages, "two up and down," are commanding 8s. and 9s. a week; three up and down 12s. to 14s. The rates are the lowest in the suburbs of London, being only 5s. 3d. in the £, and not likely ever to be more, on account of the proximity of the county asylum, which, while contributing largely to the rates, is no expense to the parish. The land is mostly freehold and cheap; being on the main line, carriage is light, and access is easy.

There is an abundance of employment in the neighbourhood, and in consequence of the facilities for getting to town it is a favourite residential suburb. The only want, and that is getting most acute, is more houses. It is no exaggeration to say that four or five hundred would find ready and good tenants.

A WOULD-BE TENANT.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—VI.

FOR the sake of illustration let us work out some examples of the application of the formulæ we have investigated in the last two chapters. First: What would be the amount of deflection of a fir beam 15 ft. span, 6 in. by 9 in., with a central load of 38 cwt.?

Our formula is (Chap. IV.) $SD=\frac{WL^3C}{BD^3}$

Here W=38 cwt. plus $\frac{5}{8}$ the weight of the beam.

The weight of the beam taken at 36 lbs. per foot cube is $15\times\cdot75\times\cdot5\times36=15\times\cdot75\times18$
$=15\times13\cdot5$
$=202\cdot5$ lbs. say 2 cwts.

$\therefore W=38+2=40$ cwt.$=2$ tons.
L=15, C=0·5, B=6, D=9.

$\therefore SD=\frac{2\times15\times15\times15\times\cdot5}{6\times9\times9\times9}$
$=\frac{5\times5\times5}{2\times9\times9}$
$=\frac{125}{162}=0\cdot77$, say $\frac{3}{4}$ in.

Referring again to Chapter IV., the student will remember that the greatest permissible deflection for a span of 15 ft. according to Tredgold is $\frac{15'\ 0''}{480}=\frac{180}{480}$ in. $=\frac{3}{8}$ in. The deflection we have found for our beam above is, therefore, one which would be noticeable, and possibly might cause plastering to crack, for the permissible deflection alluded to by Tredgold is that which is not very evident to the eye, and not likely to cause cracking of the plastering.

If the object we have in view is to ascertain the weight that can be carried without an undue amount of deflection, the question would be put in somewhat of this form: What evenly distributed load can be carried by a fir beam 8 in. by 12 in. over a span 16 ft. without causing a deflection of more than $\frac{1}{480}$ of the span?

In this case we have to transpose our formula thus:—

$$W=\frac{SD\times B\times D^3}{L^3\times C}$$

Here $SD=\frac{16\times12}{480}=0\cdot4$ in., B=8, D=12, L=16, C=0·5

$\therefore W=\frac{\cdot4\times8\times12\times12\times12}{16\times16\times16\times\cdot5}$
$=\frac{3\times3\times3}{2\times5}$
$=\frac{27}{10}=2\cdot7$ tons$=54$ cwt.

Now W contains $\frac{5}{8}$ the weight of the beam; taking this as before at 36 lbs. per ft. cube, we have:—

Weight of beam $=16\times\frac{3}{8}\times1\times36$
$=16\times24=384$ lbs. $=$ say $3\frac{1}{2}$ cwt.
and $\frac{5}{8}\times3\frac{1}{2}=2\frac{3}{16}=$ say $2\frac{1}{4}$ cwt.

$\therefore$ Permissible central load on beam $=54-2\frac{1}{4}$
$=51\frac{3}{4}$ cwt. But the distributed load which will produce the same effect is (Chap. IV.) $\frac{8}{5}$ of this, since the deflection from a distributed load is $\frac{5}{8}$ of that from a central load.

$\therefore$ Permissible distributed load $=\frac{207}{4}\times\frac{8}{5}=$
82·8 cwt.

If it is desired to find the scantling of a beam to give a certain permissible deflection with a given load over a given span, the operation is not quite so simple, as the weight of the beam, five-eighths of which is taken as its equivalent central deflecting load, depends upon the unknown scantling. In this case, therefore, the student should first of all find the necessary scantling for the required deflection with the given load, and then, having thus found an approximation to the beam required, take the weight of this as the weight of the beam required, and add five-eighths of it to the central load, or the whole of it to the distributed load actually carried by the beam, and then from this work out the scantling required. This will be very nearly, though not exactly, correct, the amount of error being that due to the difference in weight of the beam as approximately found and as required.

If the load is neither central nor distributed, but applied at some point other than the centre, the formula for deflection may be still employed, with the following modification, for the actual span: Multiply the product of the distances of the load from each support by 4, and divide by the clear actual span. Then take this quotient as the equivalent span in the formula. For example: What is the deflection in a fir beam, 15 ft. span, 6 in. by 9 in., with a load of 40 cwt. 5 ft. from one end?

Our formula is $SD=\frac{W\,L^3\,C}{B\,D^3}$

Here W = 2 tons, C = 0·5, B = 6, D = 9, and

$L=\frac{5\times10\times4}{15}=\frac{40}{3}$

$\therefore\quad SD=\frac{2\times\left(\frac{40}{3}\right)^3\times\cdot5}{6\times9^3}$
$=\frac{40\times40\times40}{6\times9\times9\times9\times3\times3\times3}$
$=\frac{32,000}{59,049}=$ say $\frac{1}{2}$ in.

This does not take into account the deflection due to the weight of the beam itself. This can be found separately, taking five-eighths of the weight as the equivalent central load, and then adding the deflection from this to that already found as produced by the load on the beam.

In dealing with the formulæ for the strength of a timber beam and an iron beam we considered only the cases in which the load on the beam was either central or evenly distributed, but there may, of course, be instances in which the load is neither one nor the other, and as we have considered such cases as affecting deflection, so we ought to deal with them as regards breaking stress. The best method of dealing with such cases, particularly in the case of iron beams, is by an application of the theory of moments, but as we must, for the present, assume that the student is not conversant with this theory, we will give a rule which will enable the student to make use of the formulæ with which he has already become acquainted. To find the amount of the central load on a beam which shall be equal in its effect to that of one or more loads at irregular distances from the supports, multiply each load by its distance from either support, and this product by the distance from the other support; add these products for the various loads, and divide by the square of half the span of the beam.

For example: What is the central load equivalent to two loads, one of 5 tons 4 ft. from one end, the other of 6 tons 5 ft. from the other end of a beam 16 ft. span.

Central load
$=\frac{(5\times4\times12)+(6\times5\times11)}{8\times8}$
$=\frac{240+330}{64}=\frac{570}{64}=8\cdot9$ tons.

For the deflection of iron beams the following will be found a convenient formula for I or channel beams under any load less than the crippling load, for beams of good wrought iron do not break under a gradually applied load till after they have bent so much as to be useless.

$D=\frac{W\times L^3}{w\times d^2\times C}$ where D is the deflection

in inches; W, load on the beam; *w*, weight of beam per yard (W and *w* being in the same denomination, lbs., cwts., or tons); L, span in feet; *d*, depth of beam in inches; C, a constant, the values of which are—

for I beam with central load, C = 11,200;
for I beam with distributed load, C = 18,000;
for channel beam with central load, C = 10,000;
for channel beam with distributed load, C = 16,000;

The stiffness of a cylinder is to that of a square beam whose breadth and depth are each equal to the diameter of the cylinder as 0·589 to 1, or that of the square one is to that of the cylinder as 1 to 0·589, or as 1·698 to 1. In practice we may use 0·6 and 1·7 as sufficiently accurate figures.

GENERAL BUILDING NEWS.

RESTORATION OF STOKE GOLDINGTON CHURCH BUCKS.—The tower and chancel of this church have recently been restored. The work has been carried out by Mr. James Kimberley, builder, of Banbury, under the direction of the architect, Mr. J. S. Alder, of London.

WESLEYAN CHAPEL, BARRY.—The new English Wesleyan chapel at Barry was opened on the 24th ult. The seating accommodation is for 624, with forty-six more in the choir. It is intended, however, when occasion may require, to introduce galleries, the building having been designed with this object in view, and this will increase the accommodation to seat 1,100. The chapel roof is in one span, the ceiling being matchboarded. There are two vestries, one for the choir, the other being the minister's vestry, both having access to the parlour, a room 22 ft. by 18 ft., and direct communication is provided to the present chapel, which in future will be used as a schoolroom. Messrs. J. P. Jones, Richards, & Budgen, Cardiff and Barry, were the architects, the contractors being Messrs. E. R. Evans Bros., Cardiff.

NEW SUNDAY SCHOOL, TRING.—A new Sunday school, adjoining Akeman-street Chapel, Tring, has just been opened. The building has been erected by Messrs. Fincher, from designs by Mr. William Huckvale.

SUNDAY SCHOOL, WHITTINGTON MOOR, DERBYSHIRE.—A new Sunday school built at Whittington Moor by the Primitive Methodist community was opened recently. The new building has been erected from the designs of Mr. Harvey, the contractor being Mr. Stubbins. The joiners' work was executed by Mr. Ellis, the painting by Mr. Green, and Mr. Craig (Chesterfield) carried out the plumbers' work. The cost of the school is about 1,500*l.*

NEW SCHOOLROOM, LANSDOWNE BAPTIST CHURCH, BOURNEMOUTH. — A new schoolroom, recently built at the back of the Lansdowne Baptist Church, was opened a few days ago. The new school will seat about 200 persons, and has been built by Mr. Mark Bailey from the designs of the architects, Messrs. Creeke & Gifford.

WESLEYAN CHAPEL, ACREFAIR, DENBIGH. — A new Wesleyan chapel was opened at Acrefair a few days ago. The architect of the new chapel was Mr. J. W. Jones, Brooklea, Acrefair, and the builder was Mr. R. Hopley. The building has a frontage of 30 ft. and a depth of 56 ft.

BOARD SCHOOL, HECKMONDWIKE.—A new Board school has just been opened at Heckmondwike. The architect of the buildings, which provide accommodation for over a thousand scholars, was Mr. Arthur A. Stott, of Heckmondwike. The front elevation is two stories high, with separate entrances for girls (at the east side) and for boys (at the west side), with a manual instruction-room, 50 ft. by 24 ft. 6 in., heating vault, and fuel stoves in the basement. On the ground floor there are cloak-rooms, lavatories, and teachers'-rooms at each entrance (for males and females respectively), and behind these is a corridor leading to a central hall for the mixed department, the measurement of this room being 89 ft. by 34 ft. Out of this room open eleven class-rooms, 24 ft. square, divided from the main room by glass partitions or doors. The infants' assembly-room, 31 ft. by 34 ft., is at the south end of the mixed main room, and will be approached from a gateway which is to be erected at the east end of the front entrance. Cloak-room and lavatory accommodation have been provided for the children and teachers separately. Out of the infants' assembly-room open four class-rooms. Provision for the science and art classes has been made in the second story of the front elevation, and the rooms are approached by two staircases leading respectively from the boys' and the girls' entrances. Over the girls' entrance is a cookery-room (30 ft. square), with scullery, cloak-room, and lavatories adjoining, and over the boys' entrance is a chemical laboratory of similar size. Between these are a science lecture-room, a physics-room, and an art class-room, the whole of which are connected in the rear by a corridor. The whole of the premises are heated by hot water on the low-pressure system. At the east end of the school is being erected a building to provide accommodation for the Board, including offices for the clerk and attendance officer, and a caretaker's house in the rear. The Board-room, on the upper floor, will be 24 ft. by 15 ft. The contractors for the various works are all local firms, namely, Messrs. George Horsfall & Son, masons; Messrs. W. & T. Milnes, joiners; Mr. Joseph Lister, ironwork; Messrs. E. Walker & Co., plumbers and glaziers; Mr. William Parker, plasterer; Mr. Jonas M. Thornton, slater; and Mr. Henry Taylor, painter.

CENTRAL SCHOOL PREMISES, BARNSLEY.—On the 17th ult. the Higher Grade Central School, under Barnsley School Board, was transferred to the premises, in Mark-street, near St. George's Church, formerly known as Harvey's warehouse. The alterations and additions have been carried out under the supervision of the architects, Messrs. R. & W. Dixon, of Barnsley. The alterations are very largely internal. The original building comprised five floors—basement, ground, first, second, and third floors, but the rooms were not sufficiently high for school purposes, and it was therefore found necessary to remove the ground and third floors, and by raising the basement floor to nearly the level of George-street, the ground floor rooms (where the main body of the school accommodation is provided) are all arranged 14 ft. high. The ground floor space is for a mixed school, and is divided into four class-rooms by sliding glazed divisions. The boys' entrance is in George-street, a new staircase in connexion with which has been built, extending to all the floors. There is a corresponding entrance and staircase for girls at the opposite end of the building, the approach from which is in Mark-street; there is lavatory and cloak-room accommodation near the entrance. The Board offices are located on the first floor, and have a separate entrance and staircase from Mark-street. They comprise—Board room, 26 ft. by 18 ft.; clerk's office, 21 ft. 6 in. by 18 ft.; attendance officer's room, lavatory, and cloak-room, and a room 30 ft. by 18 ft., which is available both as a class-room and waiting hall. There is also a headmaster's room on this floor, and two other rooms. On the upper floor are arranged the chemical laboratory for twenty students, physical laboratory for sixteen students, lecture room, balance room, cookery class-room for forty-two students, and other rooms which will be used for various purposes. The cookery room will serve for both day and evening classes. A separate new building abutting on Castlereagh-street is being fitted up on an upper floor as a manual instruction room for forty scholars. The contractors were Messrs. Walker & Blackburn, masons; Messrs. W. G. & L. England, joiners; Messrs. Needham Bros., ironfounders; H. Ashworth, plumber; Fleming, slater and plasterer; C. Hammerton, painter; John Cooke, Huddersfield, concrete and fireproof division; and Mr. F. Milan, Huddersfield, heating.

SCHOOL, LLANDRINDOD WELLS.—The County Intermediate Dual School, Llandrindod Wells, has just been opened. The school is situated to the right of the road leading to Builth. Accommodation is provided for fifty girls and forty boys, each sex having separate entrances, exits, cloak-rooms, and lavatories. An assembly-hall is centrally placed common to both sexes, flanked on either side by two class-rooms for boys and girls respectively. The back portion of the building is devoted to technical purposes, and comprises physical and chemical laboratories and a cookery laundry. Private rooms are provided for masters and mistresses, and playgrounds for the students. The school is lighted throughout by electricity. The buildings are of Ruabon red bricks with Grinsill stone dressings, and slate roofs. The general contract has been carried out by Messrs. W. Bowers & Co., of Hereford, the cement and wood-block flooring by Messrs. B. Ward & Co., Westminster, and the electric lighting by the Llandrindod Wells Electric Light and Power Company, Limited, the whole from the plans and under the superintendence of Mr. H. Teather, of Cardiff.

LINTON MEMORIAL SCHOOLS FOR ST. PETER-LE-BAILEY, OXFORD.—The new schools which have just been completed in New Inn Hall-street for the parish of St. Peter-le-Bailey, Oxford, to replace the old block of buildings at the lower end of New-road, at a cost of nearly 4,000*l.*, were opened recently by the Bishop of the diocese. The building adjoins the parish church, and is of two stories, and comprises an infants'-room, 40 ft. by 22 ft.; babies'-room, 17 ft. by 22 ft.; mixed school-room, 26 ft. by 21 ft. 6 in.; and two class-rooms, 24 ft. 6 in. by 21 ft. 6 in., and 18 ft. by 21 ft. 6 in. respectively, with separate cloak-rooms, lavatories, and staircases. By means of a moveable partition the mixed school and one class-room can be made into one large room. The architect is Mr. W. K. Shirley, and the builder is Mr. S. Hutchins.

CHURCH SCHOOL, WATERLOO, LIVERPOOL.—It is proposed to erect new boys' schools in connexion with Christ Church, Waterloo, from plans prepared by Messrs. Fry, Liverpool. The school will be built of brick, on a site between Crosby-road and Sandringham-road, at a cost of 3,000*l.* or 3,500*l.*

COTTAGE HOSPITAL, GAINSBOROUGH.—At a recent meeting of the Committee who have the Diamond Jubilee Memorial for Gainsborough under consideration, Mr. H. G. Gamble, architect, presented plans, which were approved, for the proposed cottage hospital.

ISOLATION HOSPITAL, CHESTER.—On the 25th ult. the Mayor of Chester laid the foundation-stone of a new infectious diseases hospital. Mr. H. Beswick is the architect, and the contract was given to Mr. Freman, the amount being 14,400*l.* The hospital will provide accommodation for forty-six patients, but arrangements have been made to extend the building, should that be necessary, so as to accommodate eighty patients. The building will be lighted by electricity. The wards, which have been arranged to provide separate accommodation for various diseases, will have a southerly aspect. Owing to the level nature of the ground, Shone's patent ejector system will be used for the drainage, and this will involve an additional expense of 1,750*l.*

NATIONAL PROVINCIAL BANK, LEEDS. — The business of the National Provincial Bank in Leeds was transferred on the 27th ult. from the old premises at the junction of Albion-street and Bond-street to the new structure in Park-row. Messrs. Perkin & Bulmer, of Leeds, are the architects for the building, which, as originally designed, was three stories in height, but the London and Midland Banking Company, who own the building on the opposite side of the street, interposed, asserting that the erection of three stories would interfere with their rights of light, and, though this was at first contested, the National Provincial Company eventually decided to reduce their design by one story. The new structure is in the Renaissance style. The lower half of the elevation is faced with grey granite beneath and black Labrador granite above. The upper half is a mixture of bricks from Berkshire and Yorkshire stone. Light green Westmoreland slates cover the roof. The back of the building has a frontage to Basinghall-street. In front there are two entrances; that on the right gives access to the offices on the second floor; that on the left to the bank, or, rather, to the vestibule leading thither. The bank chamber is some 70 ft. long by 42 ft. broad. The floor in front of the counter is of marble mosaic, and behind of oak blocks. The electric light fittings are of aluminium. A recess affords the manager a view of the whole of the bank, and behind that is his private room. A strong room of steel is provided, and close to it is a lift, by which the books will be sent to the basement to be deposited in other strong rooms. There is also a waiting-room. A corridor leads from the bank into Basinghall-street. On the second floor accommodation has been provided for the clerks, including a luncheon room. Rooms for the porter are situated above the ground floor. The general contract has been carried out by Messrs. Armitage & Hodgson, of Leeds, and the interior decorations and fittings have been executed by Messrs. Marsh, Jones, Cribb, & Co., of Leeds.

LIBERAL CLUB, BIRKENHEAD.—A new Liberal Club in Duke-street, Birkenhead, has just been opened. To the right of the main entrance hall is the staircase to the assembly-room. On the left is the smoke-room and reading-room. Opposite the entrance are doors leading into the billiard-room, and at the rear on the ground floor are the lavatories, committee-room, and back entrance. In the basement are the kitchen and heating chamber. A mezzanine floor has been arranged between the ground floor and the assembly hall at the rear portion of the building, which contains ladies' and gentlemen's cloakrooms, lavatories, &c. The upper floor contains a hall, capable of accommodating 400 people, platform, and retiring-rooms. The contractor was Mr. George Snape, Birkenhead, and the architect was Mr. T. Taliesen Rees.

UNIONIST CLUB, SALTCOATS, AYR. — A new Unionist club has just been erected at Saltcoats. The club, a two-story building, is situated at the top of Nine Wells-street, near to the station of the Glasgow and South-Western Railway. The accommodation on the ground floor consists of a reading-room and a committee-room, with the caretaker's house and other conveniences in the rear. The upper floor is fitted up as a billiard-room. Mr. Hugh Thomson, Saltcoats, was the architect of the building, and the entire cost will be about 1,000*l.*

LIBERAL CLUB, CLECKHEATON.—A new Liberal club has just been opened at Cleckheaton by Sir Henry Fowler, M.P. The new club is a building of two stories in the Renaissance style, and, exclusive of site and furniture, has cost 2,500*l.* The main elevation stands back a little from Northgate, and has mullioned and transomed windows. Above the entrance is a balcony. The hall is paved in mosaic; to the right is a reading-room, 28 ft. by 17 ft. 6 in., with a floor of wood blocks; opposite is the committee-room, 17 ft. 6 in. by 15 ft. 3 in. The assembly or recreation-room, on the same floor, is 36 ft. by 28 ft., and will accommodate about 180 persons. A staircase leads from behind the committee-room to the second floor, on which there are two billiard-rooms, a bar, card-room, and lavatories. The whole building is of stone, and has been erected from the designs of Mr. Rueben Castle, architect, Cleckheaton.

REOPENING OF CHURCH ROOMS, OSWESTRY.—After undergoing alterations, the Arthur-street Assembly Rooms, in connexion with Christ Church, Oswestry, were reopened a few days ago. The work has been carried out from plans prepared by Mr. Bremner Smith, the contractor being Mr. J. Higgins Oswestry.

CO-OPERATIVE STORES, LOWESTOFT.—The Lowestoft Co-operative Society, Limited, opened their new, stores at the corner of Gordon and Clapham roads recently. The architect was Mr. Alfred Clarke.

NEW BATHS, DEPTFORD.—The Deptford Baths in New Cross-road are now approaching completion, and are shortly to be opened to the public. The architect is Mr. Dinwiddy, of Greenwich. The feature of the building is the first-class swimming bath, with a water area of 110 ft. by 35 ft., surrounded by a gallery for spectators. There is a second-class swimming bath of somewhat smaller dimensions. There are sixty-nine private baths in four different departments, divided into first and second-class, for men and women. A public wash-house and laundry (containing twenty-three separate washing cubicles), together with a smaller and separate establishment laundry, are planned at the rear. The total contract sum, including the engines, electric lighting, and well plant, is 37,492*l.* The building contract has been carried out by Mr. Holloway, of Deptford; the engineering work by Messrs. Moorwood, Sons, & Co., of Sheffield; the well contract by Messrs. Tilley & Sons; and the electric light installation by Messrs. Joel & Co.

BUILDING OPERATIONS IN EDINBURGH.—The Edinburgh Dean of Guild Court sat on the 27th ult., when there were twenty-five applications for warrants, of which thirteen were granted. The Chalmers Hospital trustees were authorised to make an addition to the south of the hospital, providing on the ground floor a servants' bed-room and store, and on the principal floor a waiting and dressing-room for the out-patient department. Interim warrant was granted to the North British Railway Company to make certain alterations, mostly of an internal nature, at the Waterloo Hotel, which the company has purchased for the purpose of offices.

BIBLE CHRISTIAN CHAPEL, NORTHTAWTON, DEVONSHIRE.—This building, which is situated in Barton-lane, has just been opened. It is Gothic in style. The chapel is 28 ft. long and 24 ft. wide. The work of reconstruction has been carried out according to the plans of Mr. Halls, architect, of Dolton, and the builders were Messrs. S. Ellis & Son, of Northtawton.

PARISH ROOM, BARNWOOD, GLOUCESTERSHIRE.—The formal opening of the Barnwood Parish Room took place on the 28th ult. The building consists of a reading-room, 18 ft. wide by 28 ft. 6 in. long, with archways opening therefrom into two reading-bays on the north side. Each of these bays measures about 9 ft. by 6 ft., and an open-timbered entrance porch is placed at the north-west side of the building. The walls are faced with pressed bricks, the upper part of the gables being relieved with timber framing. The roofs are covered with Broseley tiles. The buildings have been erected by Mr. John Cullis, Gloucester, from the designs and under the superintendence of Mr. Walter B. Wood, architect, Gloucester. The gas lighting has been put in by Messrs. Beaven & Sons, and the carving is the work of Mr. H. Frith.

ROYAL INSTITUTION BUILDINGS, EDINBURGH.—Operations are at present in progress for the reconstruction of the north-west corner of the Royal Institution buildings at the foot of the Mound. It appears that the piles on which the building stands have given way to some extent at this part, and have thrown the projecting corner, with its Ionic capitals and architrave, about three inches off the straight. The wall was also cracked. The whole of the corner will be taken down to the foundations, the piles renewed, and the portion affected reared anew upon a more solid foundation. The north-east corner is also affected, but only to a slight extent, and the same drastic measures will not have to be taken in regard to it. The work is being carried out under the supervision of Dr. Rowand Anderson, the architect to the Board of Manufacturers.—*Scotsman.*

PUBLIC LIBRARY, HOXTON.—The new public library for Hoxton will not be opened until March 23, when the ceremony will be performed by Sir John Lubbock. The new building is a terra-cotta-faced structure in Pitfield-street. Mr. H. T. Hare is the architect, and Messrs. Dearing & Son are the builders.

HOUSES FOR ARTISANS, GOSPORT.—The Gosport District Council has given instructions to their Surveyor (Mr. H. Frost) to prepare a second set of plans for houses for artisans to be let at a rental of 4*s.* per week.

THE MUIR HALL OF RESIDENCE, EDINBURGH.—This building, which has been provided for women students attending the Edinburgh University, has just been opened. The alterations required to adapt the building to its new use have been somewhat extensive, and include the addition of two new stories and the entire remodelling of the interior. On the upper floors sleeping accommodation is provided for twenty-three students and the lady superintendent, while the ground floor is given up to a large dining hall to the back, and a drawing-room to the front. The kitchen and servants' bed-rooms are placed in the basement. The architects are Messrs. Dunn & Findlay.

SANITARY AND ENGINEERING NEWS.

PLUMBERS, PLUMBING, AND PUBLIC HEALTH.—On the 28th ult., Dr. Mansel-Howe delivered a lecture on this subject at the Town Hall, Maidstone, the Mayor of Maidstone presiding. The lecturer said much of the plumbing done to-day was not done by properly trained plumbers, with the result that much of the work was neither efficient nor reliable, and, unfortunately, exposed the inmates of many homes to disease which might and could be averted. Referring to the matter of sewer gas, he affirmed that much sickness was traced to this finding its way into our dwellings; and stated that quite recently Professor Corfield and Dr. Payne had signified their belief in its powers of spreading typhoid. Dr. Farquharson, M.P., had said: "We all know that the modern system of drainage, if not carried out perfectly, is simply an elaborate machine for introducing disease into our homes." And Dr. Shirley Murphy had pointed out that the recent outbreak in Shoreditch was probably due to insuction of sewage matter into a defective water main. He advocated the soil pipe being kept uniformly outside the house, and that both it and a separate relief pipe from the service drain should be carried to a point above the level of the highest portion of the house-roof, not too near to the chimneys. That all inside waste-water pipes should constitute a system apart, and never communicate with the soil pipe or service drain, but made to discharge over an outside and properly-trapped gully. Similarly, all outside rain-water pipes should empty over outside gully traps, and never communicate with the soil pipe for the purpose of emptying their contents, and never with the service drain, with the object of serving as relief pipes. He advocated also efficient classes, in connexion with technical institutes, for the better education and training of the rising generation of plumbers, and expressed the hope that Parliament would very shortly place the registration of plumbers under national recognition, so that when sanitary work had to be done it might be undertaken by competent and responsible workmen. The lecture was illustrated with lantern slides, the subjects being for the most part examples taken from Dr. Vacher's work on "Plumbing Defects."

PUBLIC WORKS, BARRY.—Mr. Herbert H. Law, C.E., held a public inquiry at the Gas and Water Offices, Barry Docks, recently, into applications made to the Local Government Board for power to obtain the following loans:—7,950*l.* for new works of water supply (including new mains, 1,750*l.* for new pumping-engine, and addition to the existing building), 350*l.* for enclosing and planting land on Cardiff-road, 1,900*l.* for private improvements, 1,300*l.* for construction of new roads, and 500*l.* portion of cost of construction of bridge over the railway at Palmerstown. Mr. J. C. Pardoe, surveyor; Mr. F. M. Harris, gas and water manager and engineer; Mr. E. W. Waite, water engineer; and others, attended the inquiry.

SEWERAGE SCHEME, CHESTERTON.—Mr. H. P. Boulnois recently held a Local Government Board inquiry at the Board-room, Chesterton, upon the proposal of the Chesterton Urban District Council to borrow 2,300*l.* for the completion of their sewage scheme. Mr. G. D. Bland, the Surveyor of the Council, described the existing sewage arrangements and the proposed works.

SLUDGE AND DUST DESTRUCTOR, LEYTON.—A public inspection of the sewage sludge and refuse destructor which has been erected by the Leyton Urban District Council, was made on the 27th ult. This destructor, which was constructed by Messrs. Beaman & Deas, has now been in constant use for over a year with satisfactory results. The sewage sludge, before being charged into the destructor, is freed from moisture as far as is conveniently possible by mechanical means, while the refuse is consumed just as it is collected from the streets and houses. Under these conditions over 16,000 tons, two-thirds being refuse and the other third sludge, were disposed of last year in four cells without the assistance of any other kind of fuel. In the process of combustion more than enough heat is generated to keep two 96-horse power Babcock & Wilcox water-tube boilers in full steam, and from these are driven, not only the pumping and pressing machinery at the sewage works, but also the fans which maintain a forced draught in the destructor cells, together with subsidiary machinery and dynamos to provide electric light for the whole of the works. All that leaves the chimney is a moderate quantity of pale brown smoke, while the incombustible residue is a hard clinker. The destructor furnaces are built in pairs, of which there are four, and each has an inclined hearth leading from the tipping platform, 8 ft. 9 in. in height, to a horizontal fire-grate. Beyond the grate is a fire-bridge, the space behind the bridge forming what is known as the combustion chamber, which is common to both furnaces. A reverberatory arch stretches over the chamber, fire-grate, and hearth, from front to back. The ashpit is hermetically sealed, and forced draught let into it by means of a fan. The whole of the sewage works and destructor buildings were carried out from the designs and under the superintendence of Mr. W. Dawson, the Surveyor.

THE BLACKWALL TUNNEL.—The Chief Engineer to the London County Council has issued a final certificate of the completion of the Blackwall Tunnel works carried out by Messrs. S. Pearson & Son. The tender from the contractors, as accepted by the Council on November 3, 1891, amounted to 871,000*l.* To this was subsequently added the amount of their contract for forming the raised approach roads, 8,952*l.*, making the total contract price 879,952*l.* The total sum included 50,000*l.* provision money, to be used as might be necessary in providing for extras incidental to the work included in the contract, such as engine and boiler houses for electric lighting, staircases in shafts, electric lighting plant, &c, All these items have been carried out, as well as certain extra works which were not contemplated at the time the contract was let, and which have been ordered or sanctioned during the progress of the work. The final measurement, when all provisions are made for extras and deductions on what may be called the measured bills of quantities, amounts to 830,294*l.*, or only 341*l.* above the cost of the contract work as originally contemplated. The value of the work for which the provision money, was intended under the original contract was 20,277*l.* and the value of the extra works not contemplated under the original contract, but which have been sanctioned by the Council during the progress of the works, was 18,905*l.*, making a total expenditure of 869,476*l.* There is, therefore, a balance of 10,476*l.* available for electric plant, wiring, &c., to the credit of the Council on the total contract sum. The Engineer has not been able at present to issue a final certificate to the electric lighting contractors, but the sum of 18,000*l.* voted by the Council for the purpose will not, the Bridges Committee state, be exceeded under these contracts and the smaller ones in connexion with the work. Adding this 18,000*l.* to the 869,476*l.*, the value of the work done by Messrs. Pearson & Son, there is a grand total for all works connected with the construction of the tunnel of 887,476*l.* This, it will be seen, exceeds only by a little over 7,520*l.*, or by less than 1 per cent., the gross amount of the original contract, and the Council has obtained, in addition to the works contemplated when the contract was let, the extra works as before mentioned.

DRAINAGE AND WATER-SCHEMES, FARINGDON.—Colonel W. R. Slacke, R.E., one of the inspectors of the Local Government Board, held a local inquiry at the Savings' Bank, Faringdon, on the 21st ult., into the application of the Rural District Council for the constitution of a special drainage district, to comprise a part of the parish of Great Faringdon, and for sanction to borrow 4,000*l.* for works of water supply for such drainage district. Mr. George Winship, C.E., of Abingdon, the Engineer to the Council, produced the plans and estimates of the water scheme, and described the various strata in the district, and the depth of each through which a shaft-hole had been sunk, and said that judging from gaugings made during the execution of the works and the period of experimental pumping, and by the rapid rise of the water after pumping had ceased, 60,000 gals. per day would be the minimum yield; equal to 20 gals. per head per day of the population. The water had to be lifted 80 ft., the velocity through the rising main was 1·38 ft. per second. The motive power would be by either a wind engine or an oil engine. The reservoir, in two compartments, would hold 180,000 gals. The distributing mains varied from 6 in. diam. to 3 in.

RESERVOIR, CLYDESIDE.—A start has been made with the construction of a new reservoir at Greenside, on the Kilpatrick Hills, for the Duntocher and Dalmuir special water district. This step was rendered necessary by the rapid growth of the district, which includes the burgh of Clydebank, which town now contains a population of nearly 20,000 inhabitants. The work is expected to last for two or three years, and the cost will be between 30,000*l.* and 40,000*l.* The filters are situated near the policies of Cochno. The engineer for the scheme is Mr. W. R. Copland, C.E., Glasgow.

PROPOSED NEW BRIDGE AT PENARTH.—At the District Council office, Penarth, Mr. Henry H. Laws, of the Local Government Board, attended recently to take evidence in support of an application to borrow the sum of 1,500*l.* for the purpose of erecting a bridge over the Taff Vale Railway so as to connect the West Cottage district with the business portion of the town. It is also proposed to close the present level crossing from Windsor-road, and remove the foot-bridge at present standing there lower down towards Cogan. Mr. E. J. Evans (Surveyor) described the new bridge which it is proposed to erect. The bridge, he said, would provide a carriageway 24 ft. in width, and a footway 6 ft. in width, the whole to be carried on steel girders.

FOREIGN.

FRANCE.—The new Committee on "Vieux Paris" has arranged that its work shall be divided between three sub-committees. The first will draw up the inventory of ancient monuments and of the artistic treasures of Paris. This Committee is principally composed of literary men and archæologists. The second Committee, almost entirely composed of architects, will occupy itself especially about the conduct of excavations and other such works.——The third of which M. Detaille is the President is to classify the works discovered or inventoried by the other two Committees.——M. Jean Paul Laurens has been elected President of the Société des Artistes Français, in place of M. Bonnat, who had been elected but declines to serve further. M. Bonnat had held the office for three years. ——The jury of the competition opened by the "New York" Insurance Company for offices in the Boulevard des Italiens and in Rue Le Peletier have awarded the first premium to MM. Morin Gonshaux and Le Cardonnel; the second to MM. J. Bernard

E. Robert; and the third to MM. A. Maistrasse and Marcel Berger.——The fifth exhibition of the Peintres Orientalistes was opened on February 1 in the Durand Ruel Gallery, and includes a collection of the works of the deceased painter Leon Belly.——On Sunday last the Palais des Beaux Arts at Lille was opened, having been closed for some time for repairs. M. Denby, painter, who has directed the work, has been appointed curator.——M. Allouard the sculptor, has just completed the model for the monument to be erected to Troyon, at Sèvres.——The Society which exploits the Eiffel Tower has been authorised by the Municipal Council of Paris to widen the gallery on the second stage by 2 mètres, and the system of lifts is to be improved. It was certainly time.

SYDNEY.—The report of the Public Works Committee, which inquired into the expediency of erecting new Houses of Parliament for the colony, and which has been laid upon the table of the Legislative Assembly, contains some interesting information. Taking the present building as a whole, and comparing it with the building according to the new design, it is found that the former contains in all 102 rooms, with an area of 34,886 ft., and that in the proposed new building the rooms would be increased in number to 188, and the area to 109,763 ft.; the difference between the present and the proposed building being sixty-six rooms and 74,877 ft. area. The estimated cost of the proposed new building is 533,484*l.*, or 1s. 8d. per cube foot for the building up to the general roof level, 60 ft. from the basement, and 3s. per cube foot for those portions above that height. It was proposed to carry out the work gradually, about 100,000*l.* to be expended annually, and the building to be completed within six years. The dome would be the last thing dealt with, as it is intended to allow the lower portions of the building, including the base of the dome, to stand for three years before the dome itself was erected. The possibility of improving the present building at a reasonable cost also engaged the attention of the committee, and they recommended the adoption of a scheme prepared, at their instance, by the Government architect, providing for alterations to the present Parliamentary Buildings at a cost not exceeding 15,000*l.*—*Sydney Morning Herald.*

STAINED GLASS AND DECORATION.

ST. MARGARET'S CHURCH, BROTTON.—A four-light west window has just been dedicated in this church by the Bishop of Beverley. In each light is a figure of an archangel standing under an elaborate canopy, all with their respective emblems; while underneath are representations of the different works with which each archangel is associated in Holy Scripture. The window has been carried out in the style of the fifteenth century, and was designed and executed by Messrs. Percy Bacon & Brothers.

HOLY TRINITY CHURCH, ROEHAMPTON.—The seven baptistry windows in this church have just been filled with stained glass. The subjects shown are the seven corporal works of mercy, "Clothing the naked" being in the centre. Each window has an angel with scroll representing the seven gifts of the Holy Ghost. The five single lights in the Lady Chapel have also been filled with stained glass; the centre light is a representation of Our Lady and Child seated, after a picture by Mr. Edward Prynne; immediately right and left are St. Anne, and St. Elizabeth. The other lights represent St. Agnes and St. Catherine. The three single windows in the side chapel are filled with figures of St. Mary Magdalen, St. Faith, and St. Lucy. The whole work has been designed and executed by Messrs. Percy Bacon & Brothers, under the supervision of Mr. Geo. Fellowes Prynne, the architect of the church.

WINDOW, MARKET DRAYTON CHURCH.—A new painted window, by Messrs. Powell, of Whitefriars, London, was dedicated at this church lately.

WINDOWS, TRINITY CHURCH, CAPENHURST.—Two stained glass windows have been placed in Trinity Church, Capenhurst, near Chester, containing figures of St. Peter and St. Paul on the north side of the nave, and St. David and St. Augustine of Canterbury on the south side. Three small windows were also lately fixed in the chancel of this church, containing representations of "The Annunciation," "The Nativity," and "The Presentation in the Temple." All these have been executed by Mr. Herbert Bryans, of London.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Hanson & Booth, surveyors and valuers, 35, Church-street, St. Helens, have taken into partnership Mr. R. B. Davidson, who has been in their employ for ten years. The name of the firm will for the present be continued as Hanson & Booth.

APPOINTMENT.—Mr. John William Harrison, one of the assistant sanitary inspectors under the Bradford Corporation, has been appointed building inspector to the Birkenhead Town Council, out of nearly 130 applicants.

THE ELECTRIC LIGHT IN THE CITY.—The Corporation of London at their meeting on the 27th ult. instructed the Streets Committee "to consider and report forthwith as to the desirability of applying to the Board of Trade for an electric lighting order to enable the Corporation to supply electric light within the City, from a station to be established by themselves or otherwise, and also to report as to the practicability of generating electricity from steam raised by burning the City refuse in specially constructed furnaces in the proposed electric light station."

THE GROSVENOR ESTATE, MAYFAIR.—For the improvement of his property the Duke of Westminster has made another extensive clearance in Mayfair by pulling down Nos. 70 and 70A, South Audley-street, 35-40, North Audley-street, with some workshops in the rear, known as 60, Lees-mews, 19-31, South-street, together with the Grosvenor Riding School, 25-33, Aldford (formerly Chapel) street, Robson's-yard, and Aldford-mews. So many of the houses in this quarter of the town have been renumbered during recent years that the task of tracing the homes of celebrated residents becomes a difficult one; still, in respect of those cited above, we may mention that in South-street—at a house then numbered 31—have lived the Duke of Orleans (Philippe Egalité), and, in 1810, at a house then No. 22, Beau Brummell.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.—The thirty-third annual meeting of this Society was held on the 25th ult. at 10, Park-street, Leeds. The President (Colonel Brooke, F.S.A.) was re-elected, on the motion of Dr. Collins, seconded by the Rev. R. V. Taylor. The Vice-Presidents were also re-elected, and the Hon. Secretary (Mr. William Brown) was re-elected. The report showed that the society is in a prosperous condition financially. Excavations have been going on at Mount Grace during the summer, under the supervision of Mr. W. H. St. John Hope. A commencement was made at the west end of the church, where the foundations of the frater were laid bare, and farther to the south, near the kitchen, part of the monastic bakehouse was discovered. This last was a building of considerable size, 12 ft. in diameter. At the east end of the church a cell, forming part of the lesser cloister, was partially excavated. In addition to the excavations, the outer cloister has been drained. If there are sufficient subscriptions, excavations will be resumed next summer, when it will be possible to make a complete ground-plan of this ruin.

THE OLD PRIORY, BIRMINGHAM.—The excavations which are being made in connexion with the rebuilding of the premises of Messrs. Berrill, in the Minories, have once more revealed a portion of the foundation of the Priory of St. Thomas, from which the Old Priory takes its name. The foundations were discovered on the occasion of alterations made a few years ago. They were the foundation-stones of an irregular wall, but what part of the original Priory could not be determined, although from the discovery of the skeleton of a female within the wall and for other reasons it was presumably the wall of the chapel dedicated to the Blessed Mary. Considerable interest was aroused by this discovery, and, it not being absolutely necessary to remove them, by the care of the architect and builder, Mr. William Jenkins and Mr. Twigg, the remaining stones were again buried, and thus awaited the next disturbance. They have not had much rest, for the building is now being finally removed preparatory to the entire re-erection of the whole block, a proceeding which necessarily will entirely remove the last possible vestige of the Priory, which has been so many times disturbed. The date of the Priory foundation was about 1280, but the chapel was probably enlarged or rebuilt by Fulk Byrmingham about 1340. The whole was surrounded by the burial-place or cemetery of the fraternity, the Augustinian Friars, and public worship and burials were continued till about 1547, when the Friars and their Prior were removed, and the Crown seized upon the whole estate, including the chapel and the dead bodies. The reappearance of the foundation-stones of the Priory has been looked for with some interest, and by the direction of the architects, Messrs. Essex, Nicol, and Goodman, every care has been taken by the foreman and clerk of the works in having the ground reopened. The extent of the remains has, however, been considerably reduced, and only one important block now remains. This was examined on the 27th ult. by Mr. J. A. Cossins, Mr. Joseph Hill, Mr. Wright Wilson, Mr. R. K. Dent, and others. Some of the stones give clear evidence of having been previously used, several of them having the colouring and whitened sides still preserved, and traces of colour still perceptible.—*Birmingham Post.*

MEETING OF BUILDERS' LABOURERS, NEWCASTLE.—A mass meeting of builders' labourers was held on the 27th ult., in the Irish Institute, Clayton-street East, Newcastle. Mr. W. Flynn, president of the Newcastle and Gateshead Trades Council, occupied the chair. Addresses on the benefits of combination were delivered by the Chairman, Mr. J. N. Bell, organiser, and Mr. J. Kelly, district delegate of the National Amalgamated Union of Labour, and a resolution to form a branch of that organisation was passed unanimously.

BUILDERS' ASSOCIATION, OLDHAM.—The annual dinner in connexion with the Oldham and District Builders' Association was held at the King's Arms Hotel recently, Mr. Samuel Smethurst presiding. W. Cunliffe, Vice-President of the Lancashire Federation of Builders, submitted the first toast, "The Oldham and District Builders' Association." In doing so, he referred to the recent dispute in the engineering trades, and said that he hoped that as far as the building trade was concerned there would be no such disturbance during the year. Still, he was not quite sure whether, during the year, there would not be some disruption in their trade, and they might be called upon to maintain their rights. It seemed to him that the employers in the building trade were fifty years behind the time. If they looked at the operatives' associations, they saw an almost perfect machine. The masters could only hope to meet such forces by being thoroughly bound together, and he was sorry to find this was not the case. He trusted that the strength of their Association would increase locally, and that in Oldham there would be complete organisation. During the year they would be faced with two or three troubles, and one would be the question of foremen being in the union. Some masters did not take a very serious view of the matter, yet it was a very serious thing. Foremen were constantly in charge of jobs, but if they were bound by the union then they would not thoroughly look after their master's interests, and the master would have no man to look after his equitable and moral rights. After twenty years' experience, he could say it was far more difficult to-day than it ever had been to conduct their business, for on every side they had to meet cast-iron and fixed rules. In conclusion, he said that the Association existed for the purpose of self-defence and nothing else.—In replying, Mr. Smethurst said that their Association ought to become more alive to the fact that they needed to be thoroughly organised for defensive purposes, which would enable justice and fair play to be given to both sides.—The toast, "The Lancashire Federation of Building Trades," was then proposed by the Chairman, and, in responding, Mr. Storr (President of the Federation) agreed that it would be far better if they all thoroughly organised themselves into one strong band.

SELL'S DIRECTORY OF REGISTERED TELEGRAPHIC ADDRESSES.—We have received the new issue of this excellent work from Mr. Henry Sell (Fleet-street, E.C.). It is published annually, with three quarterly editions; is compiled from official lists supplied by the authority of the Postmaster-General, and is a useful and well-arranged work brought well up to date. Issued with the work is a diagram showing how to travel or cable to any part of the British Empire.

THE MODERN TENEMENT.—At the quarterly meeting of the Glasgow Master Wrights' Association, in the Building Trades' Exchange, Gordon-street, on the 27th ult., Mr. Ninian Macwhannell, architect, delivered an address on "The Modern Tenement—Constructive and Artistic." He submitted a number of plans of buildings recently erected in Glasgow, which he criticised, and, in the course of his remarks, stated that the first consideration in planning was the comfort and health of the incoming tenants, and that could only be secured by seeing that light and air penetrated every corner of the house. Dark recesses meant dirt, and it might safely be assumed that where light did not penetrate air did not circulate. There must be no stagnation of air. Every house should be so planned as to facilitate a change of air. He classified the modern tenement under two distinct plans—the internal staircase plan, and the balcony plan—and favoured the internal staircase plan, because the balcony, projecting, as it did, 4 ft. from the building, interfered with the light (this was not noticeable if the windows faced the north); it also interfered with the circulation of air. Balconies did not give the same amount of privacy that is afforded by the internal staircase. The planning of single apartment houses in the same tenement with room and kitchen houses was to be commended and encouraged. Every house, not including the single apartment house, should have its own water-closet; the system of providing one water-closet for two or four houses in new tenements was condemned. All gaspipes should be exposed, and iron substituted for the usual block tin. Better glass might be adopted to glaze windows, as the amount of light was considerably modified by the quality of the glass.—*Scotsman.*

SCOTTISH BUILDING TRADES FEDERATION.—A meeting of the Executive of the Scottish Building Trades Federation was held on the 27th ult., in the Building Trades' Exchange, Glasgow, Mr. John B. Hay, builder, Dundee, President, occupying the chair. Members were present from all parts of the country, including Inverness, Aberdeen, Dundee, Perth, Edinburgh, Kirkcaldy, Hawick, Glasgow, Motherwell, Dumfries, and Dumfermline. The meeting had under consideration various matters, including the report by the Secretary (Mr. James L. Selkirk) on the formation of new branches, from which it appeared that nearly all the more important towns throughout the country had been federated. A report was also given in on the progress made regarding the adoption of the proposed "General Conditions of Contract," which was considered encouraging. On the question of an eight hours day, which had been agitating some of the branches, a resolution was unanimously adopted to the effect that the Federation use every effort to resist its introduction as most uncalled for, and likely to prove highly injurious to the general interests of trade.

BUILDING TRADES' FEDERATION, BARNSLEY.—The second annual dinner of the Barnsley Building Trades' Federation was held a few days ago at the "Coach and Horses Hotel," Mr. Councillor W. Dunk, President, occupying the chair. The customary loyal toast having been drunk, the Chairman proposed "The Yorkshire Federation of Building Employers." Mr. S. Hanson (Halifax), Secretary of the Yorkshire Federation, responded, and, in giving particulars of the Federation he represented, he said it was formed about September 30 last, with a membership of 250, and at the present time they had a membership of about 400.—Mr. T. Lindley submitted "The Mayor and Corporation," which was acknowledged by Mr. Councillor Taylor and Mr. Councillor Dunk. The "Town and Trade of Barnsley" was given by Mr. Medley and responded to by Mr. England and Mr. Guest (Blacker Hill). Mr. Goodyear proposed "The Building Trades Federation," which was responded to by Mr. R. Rymer and Mr. Snowden, the latter of whom said the Federation was not formed with any antagonistic feeling towards any one. Other toasts followed.—The officers of the Federation for the present year are: President, Councillor W. Dunk; Vice-Presidents, Councillor E. R. Taylor and Mr. William Goodyear; treasurer, Mr. T. Lindley; secretary, Mr. R. D. Snowden.

BUILDERS' EXCHANGE CLUB, LEEDS.—The annual dinner of the Leeds Builders' Exchange Club was held on the 28th ult., in the Grand Restaurant, Leeds. Mr. W. Lolley presided. The patriotic toast having been duly honoured, Mr. J. Speight gave "The Lord Mayor and City Council." Councillors Batley and Carter acknowledged the toast. "The Chairman, Deputy-Chairman, Buildings Clauses Committee, and Officials," was proposed by Mr. C. F. Wilkinson, who said the committee was the hardest-worked committee of the Corporation. When they considered that 2,160 plans passed through their hands last year, or 90 per meeting, they would agree that the duties of the committee were arduous and trying. No fewer than 2,350 houses were shown upon these plans, consisting of 21 villas, 54 semi-detached houses, 747 through houses, 1,528 back-to-back houses, and 36 miscellaneous properties, such as hotels, clubs, hospitals, baths, &c. Mr. Wilkinson suggested that the new building by-laws should be altered in several respects. Councillor Carter, Mr. D. Hainsworth, and Mr. W. Towers responded. Mr. Freeman gave "The Leeds Builders' Exchange Club," and Mr. Dews responded. He stated that, notwithstanding the strike of last year, the club was in a prosperous condition. Although there was no strike this year, the outlook was not very pleasant, as the masons, joiners, plasterers, and plumbers had sent in notices for increase of wages and alteration of rules. The Workmen's Compensation Act would occasion many lawsuits before there was a common ground established, and this would necessitate a serious outlay on the part of builders. Referring to the federation of master builders throughout Yorkshire, he said that it was necessary that the whole of the builders of Yorkshire should amalgamate. All the builders were federated together in Lancashire, and as a result they could carry on their work better than the builders of Yorkshire. They had an object-lesson in the benefits of federation in the engineers' strike. In the future the men would probably desire to vote instead of striking, and it therefore was the bounden duty of all masters to federate and vote also.—The other toasts included the health of the visitors, the Chairman, and the secretary.

THE HOUSING OF THE WORKING CLASSES.—At the Leeds and County Liberal Club, on the 29th ult., Mr. W. S. Braithwaite, architect, delivered a lecture on "The Housing of the Working Classes," with special reference to the Leeds insanitary area. The lecturer referred in detail to the various steps which had been taken in Leeds to deal with insanitary and overcrowded areas. There was, however, an area upon which dwelt 12,000 persons, which was insanitary, and which the medical officer had condemned as unhealthy. This ought to be taken in hand. Many authorities laid special stress upon the desirability of putting in order existing dwellings, rather than a wholesale demolition. A careful examination of the Ordnance Survey of this particular district showed that the purchase and displacement of a block of buildings here and there would admit light and air and ventilation into what were now close and confined courts or yards. Why, the lecturer asked, should the Corporation wait? The powers they possessed under the 1890 Act were sufficiently strong for all practical purposes and would result, if enforced, in the production of healthy homes. There were also hundreds of houses in Leeds which could not be described as healthy—houses in better districts, with cellar kitchens 6 or 7 ft. below the street level, in which the family as a rule lived, occasionally using the sitting-room above if it was not let to a lodger. It would require a very courageous medical officer to declare such houses unhealthy. The lecturer having referred to the different types of houses provided for the better-class artisans, asked what could be done for the labourer and those persons with a weekly income not exceeding 20s. a week. The Sanitary Committee intended building a number of houses on the Ivy House estate. Tenement dwellings seemed to be the only solution of the question, and he believed that the Committee intended on a portion of the estate to erect those tenements technically known as "flats." It was open to question whether these dwellings were desirable. The poor regarded them with aversion, and they were objectionable in many respects from a light and air point of view. The nearest solution, and the cheapest, in his opinion, was the two-story tenement, such as was erected in great numbers at Newcastle, Stockton, Jarrow, and other towns. They were light, airy, and well ventilated, with a through current of air. These houses were complete in themselves, having independent staircases, and containing living-room, scullery, and bedroom. The Local Authorities were the proper persons to erect these dwellings, which could be let, the lower rooms at 2s. 6d. a week, and the upper (with additional bedroom) at 3s. By erecting tenement houses of not more than three stories on three sides of a quadrangle, a playground would be left in the middle, and the houses would be attractive to the masses of the working people. In the insanitary area to be dealt with in Leeds, there were thirty-five common lodging-houses, and it was to be hoped that the Corporation would take steps to provide a good municipal lodging-house or houses when these were demolished.

NATIONAL REGISTRATION OF PLUMBERS: PUBLIC MEETING AT EXETER.—A public meeting was held at the Guildhall, Exeter, on Saturday last, under the Presidency of Alderman Domville. In presenting certificates of registration to several plumbers who had complied with the necessary regulations the Chairman said that he considered it right, being a medical man, that he should accept the invitation to preside over a meeting which had such far reaching results in the matter of public health. The object which the Plumbers' Company had in view was worthy of the assistance of every citizen. Mr. W. J. Addiscott then read a paper explaining the work of the Plumbers' Company, and the object it was hoped to obtain by the passing of the Plumbers' Registration Bill. He proposed the following resolution, which was seconded by Mr. Councillor Cole, supported by Mr. Harvey, and carried unanimously—"That this meeting of public representatives, master and operative plumbers of Exeter and district, desire to express their approval of the efforts of the Worshipful Company of Plumbers to elevate the craft, protect the public from bad plumbing, and give effect to these objects by a Bill about to be promoted in the House of Commons during the forthcoming session of Parliament."

THE TECHNICAL LECTURES IN THE CITY.—The Carpenters' Company hold three courses of lectures in their hall during the year, and are issuing the programme of that course which appeals to a larger and more general audience than the highly technical courses given in the early summer and autumn. These lectures, which begin on the 21st inst., and are, of course, more especially addressed to those engaged in architecture and building, will be fully illustrated by experiments and lantern slides. Among the lecturers are Professor Sylvanus Thompson, Professor Banister Fletcher, Professor Roger Smith, Mr. Lewis F. Day, and Dr. Longstaff. Sir John Lubbock and Sir Arthur Blomfield are among the gentlemen who have promised to preside. The subjects, &c., will be announced in our advertisement columns next week.

SLATE TRADE IN 1897.—The loss of tonnage caused by the Penrhyn strike was not made up by the increased output of the other quarries in the Bangor district, and in the Festiniog district the tonnage is about the same as in the previous year. It is a matter of regret that the financial statistics, to which we recently called attention, do not convey accurate information as to the value of the slates made. An important case as to fencing, under the Quarries Act, was tried at Carnarvon, and the magistrates decided in favour of the quarry companies; there have been several other prosecutions, in some of which small penalties were inflicted. The building trade throughout the country promises well, and the settlement of the engineers' strike will help it materially.

STATUE OF A BOLTON DOCTOR.—In Queen's Park, Bolton, on the 29th ult., a memorial statue of the late Dr. James Dorrian was unveiled. The statue was the work of Mr. John Cassidy, sculptor, Manchester, and is of Portland stone.

ILLUSTRATIONS OF THE *Builder*.—A paragraph appears in a periodical called *The Process Photogram*, under the heading "Collotype Grain for Zinco and Lithography," to the effect that "Waterlow's, of London, have for six or seven years used a similar process (phototint) for the plates in the *Builder*." This is an entire mistake. If we remember right, Messrs. Waterlow did at one time supply a few plates for this journal, but Messrs. Sprague's "ink-photo" is the only grained process which has been continuously employed in our illustrations for a good many years back.

CAPITAL AND LABOUR.

ABERDEEN JOINERS.—The operatives adhere to their request for an increase of the standard rate of wages from 8d. to 8½d. per hour. The masters consider a rise uncalled for, and also object to the demand that extra time be paid at the rate of time and a half; but, in order that a strike may be avoided, they have agreed for their part that the matter shall be settled by the arbitration of the newly-constituted Conciliation Board.—The operatives have since agreed to settle the matter by arbitration.

THE CARPENTERS' STRIKE AT TAVISTOCK.—A representative committee of the Amalgamated Society of Carpenters and Joiners from Plymouth met the master builders and carpenters of Tavistock at the Temperance Hotel, in the latter town, on the 22nd ult., with the view of effecting a settlement of the questions on which the men came out on strike on April 1 last, and which had remained open since. After considering the several points at issue for more than two hours, it was agreed that the men should in future work fifty-three and a half hours instead of fifty-six in the summer, and fifty-one in winter as previously, and that the minimum rate of wages should be 6d. per hour instead of 5d.

WAGES IN THE COVENTRY BUILDING TRADE.—The Coventry Master Builders' Association have received applications for increases from the plumbers, painters, and glaziers, and carpenters and joiners. The plumbers are getting 8½d. and 9d. per hour, and they ask for a rise of ½d.; the painters and glaziers receive 7½d., and they want 8d.; and the carpenters and joiners, who received an advance last year, demand a ¼d. extra per hour—from 8¾d. to 9d. Before any definite decision is arrived at, deputations from masters and men will meet in conference on the applications.

LEGAL.

PICCADILLY BUILDING CASE.

THE case of Marshall *v.* Mackintosh came before Mr. Justice Kennedy in the Queen's Bench Division on the 30th ult., it being an action brought to recover damages for alleged breach of an agreement made between the plaintiff and the defendant of a lease of certain ground, the site of Holloway's Hotel, Piccadilly, for a term of eighty years, from June 24, 1896, at a peppercorn rent for the succeeding year. The lessee was to take down and clear away the old buildings, and before December 25, 1896, to erect new buildings in carcase. The agreement contained a provision for re-entry in the event of the buildings not being completed by the day named, or the work not being proceeded with with due diligence. The lessee was entitled to the grant of the lease on the completion of the new buildings. On January 19, 1897, the old buildings had not been cleared away, and the plaintiff re-entered and took possession of the premises. The plaintiff subsequently was compelled to let the ground to another tenant at a greatly reduced rent, beginning to run from June, 1898. The plaintiff claimed damages—(1) loss of one year's rent, 1,100*l.*; (2) loss by reduction of rent after June, 1898.

Mr. E. Morten appeared for the plaintiff, and the defendant appeared in person.

Mr. Justice Kennedy, in delivering a reserved judgment, said, owing in some degree to the fact that the defendant had not had the advantage of professional assistance, the evidence which had been put before him was not sufficient to satisfy him. There were two questions—one of law and the other of fact. The first was whether, upon the construction of this particular agreement, the right of the plaintiff was taken away by the retaking of possession. He would not decide that question at the present stage, though he was inclined to think there must be at least nominal damages. The second question was, what amount of damages (if any) was the plaintiff entitled to recover? The test was what was the real money loss to the plaintiff. The evidence was not sufficient to satisfy him on that point. The case would therefore be referred on that point, when it could be ascertained what damages (if any) the plaintiff had sustained, having regard to all the circumstances.

MEETINGS.

FRIDAY, FEBRUARY 4.

Architectural Association.—Mr. John Belcher on "Hampton Court Palace," illustrated by lantern views. 7.30 p.m.

Royal Institution.—Mr. Alan A. Campbell Swinton on "Some New Studies in Cathode and Röntgen Radiations." 9 p.m.

Institution of Junior Engineers (*Westminster Palace Hotel*).—Paper on "Electro-Magnetic Brakes and their Capabilities," by Mr. Louis H. Walter. 8 p.m.

SATURDAY, FEBRUARY 5

Architectural Association.—First Spring Visit, to five houses in the vicinity of Park-lane, W.

Royal Institution.—Professor Patrick Geddes on "Cyprus." III. 3 p.m.

London and Provincial Builders' Foremen's Association.—Annual Dinner, Holborn Restaurant. 7 p.m.

British Institute of Certified Carpenters.—Visit to Messrs. Spence's new premises, St. Paul's Churchyard, at 3 p.m. Meeting at 6 p.m.: paper by Mr. G. Ellis, entitled "Some Account of the Structure of Timber."

MONDAY, FEBRUARY 7.

Royal Institute of British Architects.—(1) Announcement of the name of the Royal Gold Medallist for 1898. (2) Mr. E. O. Sachs on "The Housing of the Drama." 8 p.m.

Royal Academy of Arts (*Lectures on Architecture*).—Professor Aitchison, R.A., on "The Italian Renaissance." III. 4 p.m.

Surveyors' Institution.—Adjourned Discussion on Mr. A. A. Hudson's Paper on "Technical Tribunals, and Surveyors as Arbitrators." 8 p.m.

London Institution.—Professor Vivian Lewes on "Incandescent Gas Lighting," illustrated. 5 p.m.

Society of Arts (Cantor Lectures).—Mr. Cyril Davenport on "Decorative Bookbinding." III. 8 p.m.

Liverpool Architectural Society.—Mr. W. H. Bidlake, M.A., on "The Quality of Strength in Architecture." 6 p.m.

Society of Engineers.—(1) The President for the past year, Mr. George Maxwell Lawford, will present the Premiums awarded for papers read during the year. (2) The President for the year 1898, Mr. William Worby Beaumont, will deliver his inaugural address. 7.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. H. Thorp on "Early Renaissance Sculpture in Tuscany." 7.30 p.m.

WEDNESDAY, FEBRUARY 9.

Surveyors' Institution.—Annual Dinner, King's Hall, Holborn Restaurant. 6.30 p.m.

Society of Arts.—Mr. A. D. Provand on "Compensation to Workmen." 8 p.m.

Institution of Electrical Engineers.—(1) Conclusion of Discussion on Major-General Webber's paper on "The Electro-Chemical Treatment of Ores containing the Precious Metals." (2) Mr. Sherard Cowper-Coles on "An Electrolytic Process for the Manufacture of Parabolic Reflectors. 8 p.m.

Sanitary Institute.—Discussion to be opened by Prof. J. Lane Notter, M.A., on "Purification of Water for Barracks, Prisons, and other Institutions." 8 p.m.

Perth Architectural Association.—Mr. J. Y. Gray on "The Graphical Solution of Problems in Architectural Dynamics." 8 p.m.

Edinburgh Architectural Association. — Mr. J. A. Williamson on "The Vernacular of the Wren School," with lime light illustrations. 8 p.m.

THURSDAY, FEBRUARY 10.

Royal Academy of Arts (Lectures on Architecture).—Professor Aitchison, R.A., on "The Italian Renaissance." IV. 4 p.m.

Society for the Encouragement of the Fine Arts.—Mr. C. E. Keyser, F.S.A., on "Aldermaston Church and its Monuments." Limelight illustrations. 8 p.m.

Royal Institution.—Dr. Jean Paul Richter on "Some Italian Pictures at the National Gallery." I. 3 p.m.

Society of Antiquaries.—8.30 p.m.

Institution of Mechanical Engineers.—Annual General Meeting. Continuation of Discussion on Mr. P. Dawson's paper on "Mechanical Features of Electric Traction." Other papers to be read. 7.30 p.m.

FRIDAY, FEBRUARY 11.

Royal Institution.—Dr J. H. Gladstone on "The Metals used by the Great Nations of Antiquity." 9 p.m.

Institution of Mechanical Engineers.—Annual General Meeting (concluded). 7.30 p.m.

SATURDAY, FEBRUARY 12.

Edinburgh Architectural Association. — Visit (1) to the Prudential Assurance Buildings, St. Andrew-street; (2) Edinburgh Stock Exchange, St. Andrew-square; (3) Jenner's Buildings, Princes-street.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until March 12.

[1897.] 75.—CHIMNEY TOPS: *W. T. Norris.*—The chimney top is made in three parts; the lower part, fitting on to the brickwork, is cylindrical or conoidal in shape, and acts as a deflector; the middle part or casing, of similar shape, fits over the lower part, the two being so arranged as to afford an air space or inlet all round. The casing is connected to the lower part by lugs or brackets.

258.—SASH FASTENERS: *H. Hawgood.*—In two parts; the back sash part, screwed on to the meeting rail, has a vertical rod of required height, the front sash part carries a plate, extending partly over the back meeting rail, pierced for carrying the rod, which is notched or grooved for the turning of a butt or lever working on the plate.

3,210.—WINDOWS AND THEIR SASHES AND CASEMENTS: *H. C. Webb.*—The sashes are disposed in a direct line, or with one above or at the side of the other, and connected by hinges or joints to the framing or casement; thus they do not slide, but open in or out, on trunnions or pivots, their movements being controlled by fly fronts or facings hinged on to the frames.

3,421.—MATHEMATICAL DRAWING INSTRUMENTS: *C. J. Clayton.*—The inventor attaches to a drawing pen or pencil handle, or the radius leg of compasses, a bracket carrying a toothed wheel which engages with a projection on a movable pen or pencil; on or in the handle or radius leg is a spring or weight, operating upon the pen or pencil, and by the alternate raising or lowering of the pen or pencil by the wheel and spring or weight, dotted lines may be drawn.

3,710.—PIPE JOINT FOR SANITARY PURPOSES: *Jenkins & Archer.*—This consists of a spigot formed on the end of one pipe which enters a socket on the end of the other, with a space between them, into which fits a screwed collar; the socket's inner-end is preferably dove-tailed to receive a rubber or other ring, distended when the collar is screwed in, so as to make a sealed joint (of earthenware, brass, &c.).

3,737.—APPLIANCE FOR USE IN CLEANING WINDOWS, WALLS, &c.; *Edith M. Jackman.*—An inflated air-cushion is held between two spring clips turning on pivots at the unconnected ends of a three-sided frame, in which the cushion and clips can be swung end for end; to the frame is attached a handle in one length or more; the duster and leather are placed over either surface of the cushion.

4,571.—LADDERS: *L. de L. Wells (Commander R.N.).*—To give increased strength, the rounds are attached to the side bars by socket pieces that have flanges or projections which bed on shoulders along the inner sides of the bars; thus, much of the load is transmitted on to the front side of the side bar, while the shearing strain on the socket piece fastening is reduced.

4,913.—LADDERS: *T. H. Sullivan.*—Made in sections, with hinges placed alternately on the back and front, so that the sections may be folded against one another; a spring clip retains in position the sections when extended.

5,301.—VENTILATORS: *W. T. Sugg.*—This improvement, especially designed to prevent water passing down the shaft with which the cowl is connected, consists of the combination with a suction-cowl of a conical deflector and a tray for conducting the water outside the cowl, the air current, which induces a vacuum in the cowl, being directed by the deflector.

5,314.—GREENHOUSES, HOTHOUSES, FORCING FRAMES, &c.: *J. Beaufils.*—The parts are so shaped as to be capable of arrangement in different ways, by which means composite structures of various forms can be obtained. The parts consist of glazed metallic frames, with flat surfaces, the skeleton of the house or frame being composed of stays or trusses arranged parallel-wise for receiving the frame top or side.

6,067.—APPLIANCE FOR SECURING AXES, HAMMERS, AND OTHER TOOLS TO THEIR HANDLES: *Wilkinson Sword Company.*—Three metal wedges or keys are driven into the handle within the loop of the tool, three parallel saw-cuts are made in the handle-end before it is fitted into the eye of the tool; the wedges expand the wood of the handle, and should the wood shrink, and so cause slipping of the tool, the middle wedge is held by its projecting head and is drawn slightly outwards.

6,937.—SOCKETLESS ACCESS PIPE FOR CONNECTING OR REPAIRING DRAIN PIPES WITHOUT DISTURBANCE OF THE MAIN DRAIN: *Oates & Green.*—The access pipe is fashioned with both ends alike—*i.e.*, both are spigot ends; one end is inserted into the socket of the main drain-pipe, whilst the other abuts against the spigot end of the adjoining pipe, and a fireclay ring is drawn over the joint to form a socket; the access pipe has a top opening provided with a cover.

19,458.—VALVES AND FITTINGS FOR LAVATORY AND OTHER PURPOSES: *M. J. Adams.*—A vertical tube is so arranged in a socket that it may slide up and down or telescope. When this is fixed in a lavatory basin or other vessel, and is drawn out, water will remain in the vessel at that level; when it is pushed down within the socket the water will flow away. The water supply can be arranged to act without taps upon a tipping bucket, or with a vessel or displacer.

20,151.—A DOOR KNOB AND SPINDLE ATTACHMENT: *A. Waterhouse.*—The spindle is square and screwed at its corners; the nut is round and chased across its edge; the knob-neck is cast with a square hole to fit the spindle, and there is a long hole in its top for admitting the nut to drop in and screw to the spindle end; the rose-hole is large enough to slip over the neck, and thus to let the knob be fastened to the spindle.

23,518.—ADJUSTABLE SECTIONAL PIPE BENDS: *Laubsch and Others.*—The pipe-bend (for stove and other smoke pipes) is composed of a series of independent sections pivoted to one another, and has interior levers for its adjustment to the required angle or curvature.

24,139.—BRICKS FOR FIXING PURPOSES: *W. G. Jarvis.*—The brick is made of clay or brick-earth (two parts), wood sawdust (two parts), and cinder-ash or coal-dust (one part), and is intended as a substitute for wood plugs or wood bricks used, to enable nails and screws to be driven therein, for woodwork, mouldings, cornices, weathering tiles, and so on.

26,450.—STONEWARE AND METAL PIPE JOINTS: *J. Hall.*—The pipes have plain butt-ends; the joint between them is made by means of two cup-shaped rings or sockets of metal, paper, or other material, cut, stamped, spun, or otherwise prepared, so as to assume any external shape. These have slots through which the grout or filling-in is passed, and the joint is covered with a strip or tape of linen, jute, asbestos, or other fibre.

27,104.—FLOORING MATERIAL: *H. Eichler.* — The material, shaped in flags or plates, is made of sifted or screwed sawdust, quartz, and pounded lime, unslaked. A design in colour can be incrusted in the flag, which, when dry, is smoothed on a grindstone.

NEW APPLICATIONS.

For week ending January 22.

1,233, R. A. Hammersley, a Combined Lavatory Basin and Toilet Table. 1,236, F. C. Lynde, Baths, Lavatory Basins, Sinks, and the like. 1,240, J. Ward, Crucible Furnaces. 1,247, Sugden & Bailey, Ash Pans and Guards for Grates. 1,248, H. S. Parry, a Mitre Machine. 1,250, A. W. Loveland, Oil Varnish for House Decorators, &c. 1,256, H. Hauser, Shower Baths. 1,261, H. Button, a Nail. 1,263, A. Pass, Leaden Waterpipes, &c. 1,268, D. Miles, a Combination Tool for use in Paperhanging and for similar purposes. 1,275-6, S. Martin, Joints for Tubular Framework. 1,283, A. V. Pittar, Oil Cans. 1,284, J. Gange, Water-waste Preventers. 1,287, A. Wachtl, Vices. 1,289, Heaton & Thomas, for Compelling Flow of Gas by Currents of Liquids. 1,291, R. F. Shillingford, for Attaching Roller Blinds, Cloths, and the like to their Fittings. 1,297, F. C. Bormann, Heating Stoves. 1,309, J. C. Hudson, Fire Extinguishing Apparatus. 1,314, Cohn & Brunckhorst, Moulding-boxes for Making Tubular Articles. 1,315, J. Rodgers, Turret Lathes. 1,318, Bonn & Rothschild, Measuring Sticks. 1,319, P. Kleber, Building Stones and the like. 1,326, T. King, a House Window Brake. 1,338, T. W. Twyford, Baths. 1,356, P. Meredith, a Window Sash Fastener. 1,359, W. Clews, Syphon Check-flow Taps for Drawing Liquids. 1,364, G. Chisholm, Metal Ferrules for Pipe Joints. 1,371, H. Breuer, High-pressure Ribbed Pipe. 1,373, F. Marryat, Windows and their Fittings. 1,377, J. Jones, Sleeves for Pipe Joints. 1,378, Lithosite Manufacturing Company, Cements. 1,384, Scott & Hawkins, Pigments for Paints, &c. 1,389, A. Robertson, Sheet Metal Structures. 1,405, H. Howard, and 1,693, F. E. Ellis, Metal Tubes. 1,410, J. E. Duncan, Scales. 1,445, J. C. Berry, Brick Presses. 1,448, Hayward & Abbiss, Nails, Spikes, &c. 1,472, W. S. Squire, for Controlling the Flow of Water in Pipes. 1,474, W. S. Newton, Taps, Cocks, &c. 1,478, Grimshaw & Tomlinson, a Sanitary Pipe Joint. 1,487, J. H. Airey, for Drawing-off Measured Quantities of Liquids, and giving a Constant Flow at the same time. 1,498, J. Pfister, Imitation Stained Glass. 1,505, Dodd & Smith, and 1,506, H. Greenwood, Moulding Presses and Apparatus. 1,522, S. M. Angel, and 1,746, J. Cooper, Brushes. 1,538, J. Brockie, Automatic Lathes. 1,562, H. Bennett, Oil or Gas Cooking Ovens. 1,566, A. Sharples, for Forcing, Spraying, and Projecting Liquids. 1,583, T. Inglis, Water-closet Cisterns. 1,585, H. R. Riddall, Chimney Flues, &c. 1,598, M. Bousfield, a Chimney Top. 1,607, W. Allen, a Cowl. 1,612, J. Clark and others, Cement Kilns. 1,619, Matthews & Kear, for Fixing and Levelling Billiard Tables and other Furniture. 1,623, H. A. Zeckendorf, Tool Handles. 1,632, W. Foggo, Stone Breaking and Crushing Machines. 1,647, J. Morris, Plastic Mouldings. 1,676, A. E. Holdom, a Ratchet Pulley. 1,685, W. H. Bushell and others, for Heating and Circulating Water. 1,711, W. W. Wardle, and 1,713, W. Tattersall, Brick-drying Apparatus. 1,727, H. Higgins, for Drying and Warming Air for Ventilation, Desiccation, and Evaporation. 1,729, R. J. Lines, Tenon-cutting Machines. 1,734, Wootton & Martin, Metallic Tubing. 1,744, Campbell & Montgomerie, Safes, Strong-room Doors, &c. 1,750, R. Simpson, for Planing Mitre and similar Inclined Surfaces. 1,753, J. Gourlay, a Combined Lavatory Basin and Bath. 1,758, H. K. Bromhead, Fireproof Roofs and Floors. 1,763, J. Winterflood, Instantaneous Water-heaters. 1,756, B. R. Puri, Raising and Lowering Window Sashes. 1,769, P. Kleber, Fireproof Building Stones, and Cement from the same. 1,788, F. E. Winslow, Means for Preventing Infection and Ensuring of Cleanliness for Use with Water, Earth, or other Closets. 1,791, J. Ellis, Slabs or Boards for Fireproofing Ceilings, Walls, Doors, &c. 1,796, S. Pudney, a Spray Pump. 1,813, J. Craig, Window Frames and their Sashes. 1,818, H. M. Williams, Door Knobs or Handles and Spindle Attachments.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 21.—By R. GILLART & SONS (at Machynlleth).

Mallwyd, Merioneth.—"The Gartheiniog Slate and Slab Quarry," 800 a., u.t. 22 yrs., r. 100*l.*, including plant, &c.	£8,000

January 24.—By WEATHERALL & GREEN.

Mitcham.—Streatham-lane, "The Gorringe Park Estate," 69 a. 0 r. 22 p., f.	20,100

By ALFRED SAVILL & SON.

Whitechapel.—26, 28, 30, and 32, Varden-st., u.t. 9 yrs., g.r. 10*l.*	350

By ELLIOTT, SON, & BOYTON.

Norwood.—20 and 24, Portland-rd., f., r. 105*l.*	1,830
Anerley.—183 and 195, Croydon-rd., u.t. 59 yrs., g.r. 14*l.* 10s., r. 110*l.*	705
Oxford-st.—47, Upper Rathbone-pl., f., r. 45*l.*	920
Hyde Pk.—152, Westbourne-ter., u.t. 44 yrs., g.r. 5*l.*, r. 130*l.*	810

By W. A. BLAKEMORE.

Stoke Newington.—81 and 83, Alkham-rd., u.t. 82½ yrs., g.r. 12*l.*, r. 64*l.*	735
Clapton.—London-rd., f.g.r. 12*l.*, reversion in 61 yrs.	405
Fulham.—9 to 21 (odd), Orbain-rd., u.t. 87 yrs., g.r. 28*l.* 13s.	1,020
Poplar.—2, Shirbutt-st., f., r. 19*l.* 10s.	205
12, 13, 14, and 15, James-pl., c., r. 62*l.* 8s.	460
Cheshunt.—Cheshunt-st., "Greenhall," c., r. 15*l.*	295
1 to 5, Mill-lane, c., r. 47*l.* 17s. 8d.	300

By STRAKER & SON (at Brynmawr).

Llanelly, Brecon.—"The Rhonos Farm," 109 a. 2 r. 8 p., f.	2,100

January 25.—By C. W. DAVIES.

De Beauvoir Town.—29 and 31, Ardleigh-rd., u.t. 30½ yrs., g.r. 12*l.*, r. 90*l.*	720
Islington.—6, 7, 8, and 9, Dibden-st., u.t. 46½ yrs., g.r. 24*l.*	495
Highbury.—42, Highbury-hill, u.t. 67 yrs., g.r. 15*l.* 15s., r. 65*l.*	500
Barnsbury.—62, Albert-st., u.t. 50 yrs., g.r. 6*l.*, r. 32*l.*	265

By J. J. DEVERELL.

Finsbury-park.—24, Oakfield-rd., u.t. 78½ yrs., g.r. 10*l.* 10s., r. 50*l.*	650

By GRAVES & SON.

Bayswater.—36, Kildare-ter., u.t. 53 yrs., g.r. 7*l.*, e.r. 80*l.*	620

By J. & R. KEMP & CO.

Regent's-park.—44, 46, 50, 52, 54, and 56, Albany-st., u.t. 26½ yrs., g.r. 60*l.*, r. 432*l.* 10s.	3,690
13 to 23 (odd), Little Albany-st., u.t. 26½ yrs., g.r. 27*l.*, r. 139*l.*	670
145, Albany-st., u.t. 15 yrs., g.r. 15*l.*, r. 65*l.*	300
Marylebone.—Montagu-sq., &c., i.g.r. 61*l.* 9s., u.t. 3 yrs., g.r. nil	110

By ALEX. PHILLIPS.

Kilburn.—21, 23, 25, 27, and 31, Burton-rd., u.t. 89 yrs., g.r. 50*l.*, r. 250*l.*	2,605
9, 11, 13, and 21, Plympton-rd., u.t. 92 yrs., g.r. 38*l.* 7s., r. 183*l.*	1,795
Maida Vale.—10, Clifton-villas, u.t. 53 yrs., g.r. 12*l.*, e.r. 75*l.*	605
Harrow.—Pinner-rd., two freehold building plots	210

By RUTLEY, SON, & VINE.

Tottenham Court-rd.—10, Little Goodge-st., f., r. 86*l.* 9s.	660

By S. H. BAKER (at Masons' Hall Tavern).

Piccadilly.—Denman-st., "The Devonshire Arms" p.-h., u.t. 26½ years, r. 120*l.*, with goodwill	11,000

By BELTON & SONS (at Masons' Hall Tavern).

Marylebone.—Westmoreland-st., "The King's Head" p.h., an improved rental of 65*l.* for 15½ years, with reversion for 7¾ years	1,910
Kingsland. — Mansfield-st., "The Middleton Arms" p.-h., a freehold rent of 100*l.*, reversion in 39½ yrs.	3,000
Bethnal Green.—Bacon-st., "The Ship" p.-h., a freehold rent of 70*l.*, reversion in 9½ yrs.	2,000

By ELLIOTT, ELLIS, & CO. (at Plymouth).

Plymouth.—Old Town-st., "Chubb's Hotel," together with 1, 2, and 3, East-st., f.	34,500

January 26.—By BEARD & SON.

Bayswater.—16, Burlington-rd., u.t. 61 years, g.r. 10*l.*, r. 100*l.*	460

By HARMAN BROS.

Wandsworth.—44, West Hill, u.t. 86 yrs., g.r. 10*l.*, r. 55*l.*	570

By INMAN & CO.

St. John's Wood.—4, Bolton-rd., u.t. 52 yrs., g.r. 10*l.* 10s. r. 40*l.*	405

By E. W. RICHARDSON & SON.

Hornsey Rise.—66 and 68, Mulkern-rd., f., e.r. 70*l.*	1,050
New Southgate.—26, 27, and 28, The Avenue, f., r. 65*l.*	520

January 27. — By WHEATLEY KIRK, PRICE, & CO.

Battersea. — New-rd., the Projectile Company's Works, area 2 a. 2 r. 8 p., u.t. 67 yrs., r. 310*l.*, with goodwill, plant, &c., as a going concern	75,000

By NEWBON, EDWARDS, & SHEPHARD.

Edmonton.—54 and 56, Silver-st., f., e.r. 83*l.*	1,420
The Crescent, f.g.r. 3*l.*, reversion in 28 yrs.	130
Kentish Town.—34 and 36, Torbay-st., u.t. 40 and 33 yrs., g.r. 11*l.*	510

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Public Baths	Winchester T.C.	25*l.* and 15*l.* premiums	Feb. 28

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Completing Back Durham-road	Leadgate (Durham) U.D.C.	J. W. Coupland, Council's Offices, Shotley Bridge, co. Durham	Feb. 7
Sewering Bright-street, &c.	Crewe T.C.	G. E. Shore, Boro. Surv. Earle-street	Feb. 8
Kerbing, &c. Holt-street	do.	do.	do.
Pipe Sewer, Craig-place, Torry	Aberdeen T.C.	W. Dyack, Boro. Surv. Town House	do.
Sewerage Works, Homer-lane, Rochdale		J. Tunnicliffe & Son, Ltd. Clover Croft Works Rochdale	do.
Store and Room at Workhouse	Belfast Union	Young & Mackenzie, Engr. Donegall-sq. East, Belfast	do.
Three Houses and Shop, Catcliffe, nr. Rotherham		J. Platts, Archt. High-st. Rotherham	do.
Three Houses, Coastguard, Hove, Sussex	Admiralty	Director of Works Dept. 21, Northumberland-avenue, W.C.	do.
Gasholder Tank	Hexham Gas Co.	H. Lees, C.E. Gas Works, Hexham	do.
Four Houses, Eaton-road, Ilkley		E. B. Johnson, Archt. Ilkley	do.
House, Dunning, N.B.	Dr. Donaldson	D. Smart, Archt. Perth	do.
Villa, Stables, &c. Bridge-street, Stowmarket	G. Draper	H. G. Bishop, Archt. Market-pl. Stowmarket	Feb. 9
Retaining Walls, &c. Berry, Pomeroy	Totnes R.D.C.	T. W Windeatt, Church-lane, Totnes	do.
Technical School, Park-street, Hull		Botterill Son, & Bilson, Archt. 23, Parliament-st. Hull	do.
Warehouse, Lowest. Mill, Keighley	Sugden & Co.	W. & J. B. Bailey, Archt. 1, Scotcst Keighley	do.
Scullery Houses, Castle-hill, Raatrick		Sharp & Waller, Archt. 32, Bradford-road, Brighouse, Yorks.	do.
Additions, Sandhoe House, Corbridge-on-Tyne		J. Potts & Son, Archt. 57, John-st. Sunderland	do.
Sewerage Works, Cooke-street, &c.	Stretford D.C.	F. Whitworth, Council's Offices, Old Trafford	do.
Sewage Disposal Works, Holmside Village	Lanchester R.D.C.	J. E. Parker, C.E. Post Office Chmbrs. Newcastle	do.
*Works, Services, and Materials (various)	Battersea Vestry	J. T. Pilditch, Municipal-bldgs. Lavender Hill, S.W.	do.
Blocks of Houses, Howe-street, &c.	Plymouth Corp.	J. Paton, Boro Engr. Town Hall	Feb. 10
House, Tweed-street, Berwick		W. Gray, Archt. 2, Ivy-pl. Berwick-on-Tweed	do.
Two Houses, Barnard-street, Salisbury	Municipal Charity Trustees	J Harding & Son, Archt. 5, Canal, Salisbury	do.
Rebuilding "Boot" Inn, Bedford-st. Plymouth		B. P. Shires, Archt. Central Exchange, Plymouth	do.
Painting, &c. Works, Offices, Townhead	Rochdale Union	R. A. Leach, Union Offices	do.
Stables, &c Knowsley-street, Bury, Lancs.	Bury District Co.-op. Provision Soc. Ltd.	T. Nuttall, Archt. 20, Market-street, Bury	do.
Additions, &c. to Workhouse	Cardigan Union	D. Davies, Union Offices, Cardigan	do
Residence, Carrigans, Ireland		R. E. Buchanan, Archt. 33, Shipquay-st Londonderry	do.
Haslingden Kerb, &c.	Birmingham Corp.	City Surv. Council House, Birmingham	do.
Additions to National Schools, Gwersyllt	J. Plant	Mr. Brassbaw, Glanllyn, Gwersyllt, Wales	Feb. 11
*Dwelling Houses, &c. Dungeness	Admiralty	Coast Guard Station, Dungeness	do.
Alterations, &c. to Chapel, Penygraig, Wales		T. D. Evans, Archt. Penygraig	Feb. 12
Six Houses, Wibsey, Yorks		J. Cowgill, Archt. Albany Buildings, Bradford	do.
Three Houses, Empress-road, Newtown, Wrexham		T. Breese, 24, Empress-rd. Wrexham	do.
Additions to West Vale Mills, Halifax		C. F. L. Horsfall & Son, Archt. Lord-st. Chmbrs. Halifax	do.
Two Houses, Mile Cross Estate, Halifax		do.	do.
Cast-iron Pipes	Ilkley U.D.C.	W. B. Woodhead & Son, C.E. 18, Exchange, Bradford	do.
Bridge Improvement Works, Warkworth	Alnwick R.D.C.	H. W. Walton, Council Offices	do.
Theatre, Aberdare	Lyric Co. Ltd.	F. Roderick, Archt. Aberdare	do.
Road Metal	Ouncle R.D.C.	N. E. Dixon, Surv. Oundle	do.
Granite	Rugby R.D.C.	J. W. Pendred, Union Workhouse, Rugby	do.
Surgery, Ebbw Vale, South Wales		Thos. Evans, Sec. Estate Office, Ebbw Vale Works	do.
Carriage Bridge, Dorstone	Hereford C.C.	H. T. Wakelam, C.E. Shire Hall, Hereford	do.
Granite and Slag (16,000 tons)	Spilsby R.D.C.	F. J. Dixon, C.E. Spilsby	do.
Forming, Kerbing, &c. Meadowside-rd.	Lancaster Corp.	Boro. Surv. Town Hall	do.
New Road along River Trent	Nottingham Corp.	A. Brown, C.E. Guildhall, Nottingham	do.
*Services and Materials (various)	Lambeth Vestry	J. P. Harrington, Vestry Hall, Kennington Green	Feb. 14
Farm, Daviot Branch Asylum, Aberdeen		G. Taylor, The Asylum, Aberdeen	do.
Wards and Offices, Workhouse	Uckfield (Sussex) Union	F. Holman, Union Offices, Lewes	do.
Alterations to Shop Premises, Boston Spa		Buttery & Birds, Archts. Queen-street, Morley	do.
Additions to School, Buckley, Chester		J. H. Davies & Sons, 21, Newgate-street, Chester	do.
Warehouse, Stabling, &c. Charlestown-road, Halifax		J. F. Walsh, Archt. L. & Y. Bank-chmbrs. Halifax	do.
Cloak-room, Offices, &c. at School, near Bawtry	Mission Sch. Trustees	Rev. F. W. Keeus, Misson Vicarage, Bawtry	do.
Bridge Work	Bengal, Nagpur Railway Co. Ltd.	Sec 132, Gresham-house, Old Broad-street, E.C.	do.
Cast-iron Piping, &c.	Burma Railways Co. Ltd.	Sec. 76, Gresham-house, Old Broad street, E.C.	do.
Alterations to Schools, Tividale	Rowley Regis Sch. Bd.	J. T. Meredith, Archt. Kidderminster	do.
Theatre, Wellington-street, Barnsley	Theatre Royal Co.	H. Crawshaw, Archt, 13, Regent-street, Barnsley	do.
Mortuary, &c.	Portishead U.D.C.	T. J. M. Flower, C.E. Carlton-chambers, Baldwin-street, Bristol	do.
Parish Church, Doniskean, near Dundrum, Ireland	Rev. M. Ryan, P.P.	W. S. Doolin, Archt. Dawson-chambers, Dublin	do.
Granite Metal, &c.	East Retford T.C.	J. D. Kennedy, Boro Surv. East Retford	do.
Hartshill Stone	Banbury R.D.C.	E. L. Fisher, Horse Fair, Banbury	do.
Slag and Limestone	Chesterfield R.D.C.	T. A. Busbridge, Surv. Eckington, Chesterfield	do.
Sanitary Work at Workhouse	Tipperary Union	E. A. Hackett, C.E. County Surveyor	do.
*Granite, Limestone, Slag, Gravel, Coal, Oil, Ironmongery, Collection of Refuse, &c	Hendon R.D.C.	S. S. Grimley, Public Offices, Hendon, N.W.	do.
*Buildings, Walling, &c.	Dartford Union	G. H. Tait, Lowfield st. Dartford	Mar. 14
*Works and Materials	Tottenham U.D.C.	712, High-rd. Tottenham	Feb. 15
*Cast Iron Pipes	County Boro of Croydon	Boro Engr. Town Hall	do.
*Additional Story to Hospital	Wilts C.C.	County Surv. Trowbridge	do.
*Wood Paving	Shoreditch Vestry	J. S. Dixon, Town Hall, Old-street, E.C.	do.
Homes and House, near Workhouse	Blackburn Union	Stones & Gradwell, Archts. Richmond-ter. Blackburn	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Additions to Hospital, Devizes	Wilts County Asylum Visitors	C. S. Adye, County Surv. Trowbridge	Feb. 15
Additions to Schools	Herne Bay Sch. Bd.	E. Collard, Archt. East-street, Herne Bay	do.
Warehouse, Croft Mills, Cowling	Binns & Sons, Ltd.	J. Hartley, Archt. Exchange-buildings, Skipton	do.
*Disinfectants, Works and Repairs, Various Tools, Brooms, Ballast, Wood Blocks, Cement, Lime, York Paving, &c	Westminster Vestry	G. R. W. Wheeler, Town Hall, Caxton-street, S.W.	Feb. 15 and 16
*Stoneware Pipes, Traps, &c.	Hove U.D.C.	H. H. Scott, Town Hall	Feb. 16
*Works and Materials (various)	Hampstead Vestry	Surv. Vestry Hall	to
*Works and Articles (various)	St. Luke's Vestry	Vestry Hall, City-rd. E.C.	do.
Purifiers, Gas Works, &c.	Middleton Corp.	T. Duxbury, Gas. Engr. Gas Works, Middleton	do.
Factory Buildings, Offices, Stables, Fences, &c.	Schultze Gunpowder Co.	Lemon & Blizzard, Castle-lane, Southampton	do.
Additions to Offices, St. Michael's road, Southsea	Portsea Island Union	Rake & Cogswell, Archts. Prudential - buildings, Portsmouth	do.
Vestries, All Saints' Church, Nottinghill, W.		Boreham & Morton, Survs. Sund-rland	do.
*Works and Materials (various)	Hammersmith Vestry	Surveyor, Town Hall	do.
Sewer, &c. High-street	Cheadle R.D.C.	F. T. Huskip, Surv. Brook House, Cheadle	do.
Extension of Crouch House-road	Sevenoaks R.D.C.	Fox & Taylor, Surv. Edenbridge	do.
*Wards and Lodge, Farm Buildings, Alterations to Offices, at Workhouse	Stoke-upon-Trent Union	C. Lynam, Archt. Stoke-on-Trent	do.
*Paving	Greenwich Bd. of Wks	141, Greenwich-road, S.E.	do.
Sewers, Douglas	Cork Union	J. Cotter, Union Offices	Feb. 17
Pipe Sewer, Villa-st. nr. Birmingham	Aston Manor U.D.C.	H. Richardson, C.E. Council House, Aston Manor	do.
Warehouse, Millbank, Berryden-road, Aberdeen	Northern Co-op. Co. Ltd.	R. G. Wilson, Archt. 181A, Union-street, Aberdeen	do.
*School	Frinton (Essex) S.B.	S. T. James, Frinton-on-Sea	Feb. 18
Granary, Avonmouth	Bristol Corp.	J. M. McCurrich, Docks' Engr. Cumberland Basin	do.
Additions to National School, Settle		Hy. Ross, Archt. Cannon-street, Accrington	Feb. 19
Rebuilding Uppermill Bridge, over River Tame	West Riding C.C.	J. V. Edwards, County Surv. Wakefield	do.
Main Sewer, Sutton-lane, Broughton Astley	Lutterworth R.D.C.	J. C Coates, Surv. Bittes-well, near Lutterworth	do.
Broken Granite, Filut, &c.	Bedfordshire U.C.	County Surv. Shire Hall, Bedford	do.
Enlargement of Schools, Oak-street	Bath Sch. Bd.	W. J. Willcox, Archt. 1, Belmont, Bath	Feb. 21
Schools, Gnoll Park-road	Neath Sch. Bd.	J. C. Rees, Archt. St. Thomas'-chmbrs Neath	do.
(Steel Rails (12 780 tons)	Government of Victoria	Agent-Gen. 15, Victoria-street, S.W.	do.
*Services and Materials (various)	Islington Vestry	Vestry Hall, Upper-st. N.	Feb. 24
Schools, Paulton, Somerset		W. F. Bird, C.E. Midsomer Norton	do.
*Hardwood Paving, Flagging, Curbing, &c.	Kingston-on-Hull Corp.	A. E. White, Town Hall, Hull	do.
*Five Almshouses and Offices	Boro. of Lyme Regis	Council Rooms, Lyme Regis	Feb. 28
Additions to Court House, Llanrwst, North Wales		R. L. Williams, County Surv. Denbigh	Mar. 1
Concrete Sewer	Oldham Corp.	S. A. Pickering, Boro. Surv. Oldham	Mar. 2
*Extension of Middlesbrough Dock	N.E. Rly. Co.	Sir J. Wolfe Barry, 21, Delahay-st. Westminster	do.
*Construction of Bridge and Approaches and Station Buildings, Pallion, near Sunderland	do	C. A. Harrison, Central Station, Newcastle-on-Tyne	do.
Stone Bridge over Towy, Llangathen	Carmarthen C.C.	W. B. Davies, County Road Surv. Llandilo	Mar. 14
Road, Anstey		A. F. M. Downie, Alton Hants	No date
Farm Buildings, Remshaw Moor, near Chorley		Jolly & Buckley, Archts. High-street, Chorley	do.
Additions to Royal Baths	Harrogate Corp.	W. Bennett, Royal Baths Offices, Harrogate	do.
Ten Houses, Burley-in-Wharfedale, near Bradford	J. G. Black	Whitehead & Smetham, Archts Albert-chmbrs. Albert-street, Harrogate	do.
Levelling, Paving, &c. Weymouth-road and Others	Harrogate Corp.	S. Stead, Boro. Surv. Municipal Offices	do.
Business Premises, Dickenson-road, Rusholme, Manchester		S. H. Sekian, 48, Furness-rd. Withington, Manchester	do.
Theatre, St. John's-road, Stockton		W. Duncan, Archt. 35, Albert-rd. Middlesbro	do.
Additions to Cocoa Works, Haxby-road, York	Rowntree & Co.	Stark & Rowntree, Archts. 249, West George-street, Glasgow	do.
Offices, Millbay-road and Hobart-st Stonehouse		W. T. M. Mear, Archt. Wadebridge	do.
Schools, Daniel Hill, Upperthorpe	Sheffield School Board	Hemsoll & Paterson, Archt. 18, Norfolk-row, Sheffield	do.
Exit Stairs, &c. Peel Mills, Morley, Yorks		Buttery & Birds, Archt. Queen-street, Morley	do.
"Britannia" Hotel, South Shields	J. Rowell & Son, Ltd.	J. W. Donald, Archt. Russell Chbrs. S. Shields	do.
Three Villas New road, Llanelly		W. Griffiths, Surv. Falcon Chambers, Llanelly	do.
Additions to Business Premises, near Hessle-road, Hull		E. Whitlock, Archt. 26, Scale-lane, Hull	do.
Grammar School Buildings, Ramsgate		J. Emes, Archt 151, Ebury-street, Eaton-sq. S.W.	do.
House, South Church-road, Southend-on-Sea		W. J. Wood, Archt. 26, Alexandra-st. Southend	do.
Four Houses, Darfield, near Barnsley		Jno. Robinson, Wombwell, Barnsley	do.
Block of Shops, Chingford		J. E still, Archt. 82, Queen-street, Cheapside, E.C.	do.
Laying-out Grounds, Walls, &c.	Weedon Parish Council	J. B. Williams, Surv. Moot Hall, Daventry	do.
Reservoir, Kislingbury	Northampton R. D. C.	W. Hull, Archt. 12, St. Giles'-st. Northampton	do.
Kilns, Machine Sheds, &c. Whittlesea		F. H. Cooke, Surv. Peterborough	do.
Sewering, Paving, &c. Berry-street, and others	Brierfield U. D. C.	J. T. Landless, C.E. Station Buildings, Nelson	do.
Granite Paving, &c.	do.	do.	do.
Extension of Electric Light Station	Burnley Corp.	G. H. Pickles, Boro. Surv. Town Hall	do.
Re-building "Shades" Inn, Cherry Garden-street, Devonport		B. P. Shires, Archt. Central Exchange, Plymouth	do.
Block of Houses, Clondara-street Belfast	T. O'Neill	W. J. Moore, Archt. Whitehall Buildings, Ann-street, Belfast	do.
Presbyterian Church, Bangor, co. Devon		W. J. W. Roome, Archt. Ann-street, Belfast	do.
134 Houses at Six Bells, near Abertillery, Mon.	John Lancaster	C. T. Evans, Archt. 8, Queen-street, Cardiff	do.
Stables, &c. Barrow-in-Furness	W. Postlethwaite	E. M. Young, Archt. 90, Duke-street, Barrow	do.
Two Houses, Victoria Park Estate, Bramley, Leeds		A. E. Dixon, Archt. 5, Park-lane, Leeds	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Drainage Works' Foreman	Bethnal Green Vestry	2*l.* 10*s.* per week	Feb. 9
*Superintendent of Scavenging and Cleaning	St. Luke Vestry	200*l.* rising to 230*l.* per ann	Feb. 12
*Borough Engineer and Surveyor	Derby Corp.	600*l.* rising to 750*l.* per ann	do.
*Clerk of Works	Tottenham U.D.C.	2*l.* 10*s.* per week	Feb. 15
*Borough Engineer and Surveyor	South Shields T.C.	500*l.* rising to 700*l.* per ann.	Feb. 21

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. vii. viii. *&* ix. *Public Appointments, pp.* xvi. *&* xix.

ighbury.—189, Blackstock-rd., u.t. 72½ yrs., g.r. 10*l.*, r. 40*l.* £405
Tottenham.—11 to 21 (odd), Henry-rd., u.t. 70 yrs., g.r. 18*s.* 18*s.* 610

By PHILLIPS, LEA, & Co.

Hackney.—21, Fremont-st., f., r. 30*l.* 505
90, Cassland-rd., u.t. 88 yrs., g.r. 6*l.* 6*s.*, e.r. 40*l.* 360
ictoria Pk.—85 and 87, St. Thomas'-rd., u.t. 56 yrs., g.r. 12*l.*, r. 72*l.* 700
46 and 48, St. Thomas'-rd., u.t. 56 yrs., g.r. 7*l.*, r. 100*l.* 1,020
91, 97, and 99, St. Thomas'-rd., u.t. 56 yrs., g.r. 18*l.* 15*s.*, e.r. 132*l.* 1,065
137, Victoria Park-rd., u.t. 47 yrs., g.r., 6*l.* 6*s.*, r. 40*l.* 340
Palmer's Green.—Meadowcroft-rd., 21 freehold building plots 895
Forest Gate.—52, Osborne-rd., u.t. 75½ yrs., g.r. 7*l.*, r. 30*l.* 260

By FAREBROTHER, ELLIS, & Co.

India, Assam.—"The Oaklands Tea Estate," area 1,580 a., f. 35,500

By E. SIMPSON.

Peckham.—10 and 12, Clifton-cres., u.t. 48½ yrs., g.r. 13*l.* 328

By STIMSON & SONS.

Fulham.—Fulham-rd., &c., i.g.r. 326*l.*, u.t. 47 yrs., g.r. 100*l.* 3,850
Bermondsey.—59, 61, 63, and 65, Bermondsey New-rd., f., r. 191*l.* 4,560
Wimbledon.—240 and 242, Haydon's-rd., and 2 to 12 (even), Milton-rd., u.t. 82 yrs., g.r. 44*l.* 900
Stratford.—Maryland-rd., f.g.r. 16*l.*, reversion in 68½ yrs. 420
Old Ford.—Roman-rd., l.g.r. 8*l.*, u.t. 57 yrs. 165

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	0/0/0
Teak, E.I.	12/10/0	15/10/0
Sequoia, U.S.ft.cu.	1/8	1/10
Ash, Canada, load	3/5/0	4/10/0
Birch, do.	4/2/6	6/0/0
Elm, do.	4/0/0	5/0/0
Fir, Dantsic, &c.	2/16/0	3/16/0
Oak, do.	2/2/6	3/2/6
Canada	4/15/0	6/0/0
Pine, Canada red	0/0/0	0/0/0
Do. yellow	2/12/0	4/10/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg	5/0/0	6/10/0
Wainscot, Riga, &c., log	2/10/0	3/10/0
Odessa, crown	2/10/0	3/10/0
Deals, Finland 2nd & 1st std 100	7/10/0	8/0/0
Do. 4th & 3rd	7/10/0	8/0/0
Do. Riga	6/0/0	7/0/0
St. Petersburg, 1st yellow	9/10/0	12/0/0
Do. 2nd yellow.	8/10/0	10/0/0
Do. white	8/0/0	10/0/0
Swedish	8/10/0	15/0/0
White Sea	9/0/0	15/10/0
Canada, Pine 1st	19/10/0	25/10/0
Do. do. 2nd	14/0/0	16/10/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce, 1st	9/10/0	11/0/0
Do. do. 3rd and 2nd	7/0/0	8/0/0
New Brunswick	6/10/0	7/0/0
Battens all kinds	5/0/0	18/0/0
boards, sq., 1 in. prep. 1st	0/8/6	0/15/6
Do. 2nd	0/7/0	0/12/0
Other qualities—	0/5/0	0/6/6
Cedar, Cuba, ft.	/4	/4½
Honduras, &c.	/3½	/4½
Mahogany, Cuba	/5	/6½
St. Domingo, cargo av.	/4½	0/1/3
Mexican, do. do.	/3½	/4½
Tobasco, do. do.	/4	/6½
Honduras, do.	/4½	/6
Box, Turkey, ton	4/0/0	15/0/0
Rose, Rio	7/0/0	14/0/0
Bahia	6/0 0	12/0/0
Satin, St. Doming.	0/0/5	0/1/0

TIMBER *(continued)*.		
Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian	0/-/3	0/0/7
METALS.		
Iron—Pig, in Scotland ton	2/5/8	2/5/10½
Bar, Welsh, in London	5/15/0	5/17/6
Do. do. at works in Wales	5/10/0	5/12/6
Do. Staffordshire, in London	6/5/0	7/10/0
COPPER—British cake and ingot	52/-/0	52/10/0
Best selected	5c/0/0	54/ /0
Sheets, strong	58/0/0	58/10/0
Chili bars	49/3/9	0/0/0
YELLOW MTL. lb.	4½d.	5d.
LEAD—Pig Spanish ton	12/10/0	0/0/0
English com. bands	12/12/6	0/0/0
Sheet, English 6 lbs. per sq. ft. and upwards	13/15/0	0/0/0
Pipe	14/5/0	0/0/0
ZINC—English sheet ton	20/5/0	0/0/0
Vieille Montagne	21/10/0	0/0/0
Spelter	17/17/6	18/0/0
TIN—Straits	63/1/3	0/0/0
Australian	63/12/6	64/2/6
English Ingots	65/15/0	66/15/0
Banca	61/0/0	0/0/0
Billiton	59/15/0	60/-/0
OILS.		
Linseed ton	15/12/6	0/0/0
Cocoanut, Cochin	27/15/0	0/0/0
Do. Ceylon	22/-/0	0/0/0
Palm, Lagos	21/15/0	0/0/0
Rapeseed, English pale	27/10/0	0/0/0
Do. Brown	26/0/0	0/0/0
Cottonseed ref.	14/5/0	15/5/0
Oleine	13/10/0	14/10/0
Lubricating U.S.	0/5/3	0/7/6
Do. Black	0/5/0	0/6/6
TAR—Stockholm barrel	1/0/0	0/0/0
Archangel	0/12/6	0/ /0
Turpentine	24/5/0	0/2/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

ABERTILLERY (Mon).—Accepted for the erection of girls' schools, for the Aberystruth School Board. Mr. Geo. Rosser, architect, Newport and Abercarn (Mon.):—
A. P. Williams, Abertillery (Mon.) £2,073 15

REDFORD.—Accepted for the erection of offices and store rooms at Electricity Works:—
Rootham & Jeakings, Bedford £329

BROMLEY (Kent).—For additions to workhouse, Farnborough, for the Union Guardians. Mr. John Ladds, architect, 7, Doughty-street, London, W.C. Quantities by Mr. Alfred Boxall, 6, John-street, Adelphi, W.C.:—

	Infirmary.	Nurses' Quarters.	Drains and Fence Walls.	Corridors, &c.	Total.
	£	£	£	£	£
Holloway Bros.	7,692	2,792	825	832	12,141
Patman & Fotheringham	6,875	2,502	815	743	10,933
A. N. Pryer & Co.	6,840	2,497	740	665	10,742
R. A. Lowe	6,729	2,415	668	718	10,531
G. E. Wallis & Sons	6,687	2,390	642	676	10,393
Thos. Knight	6,439	2,362	658	689	10,149
J. Otway	6,333	2,291	736	702	10,064
T. D. Graty	5,978	2,197	545	635	9,355
T. W. Jones, Beckenham (accepted)	5,800	2,120	519	615	9,054

BROMLEY.—For the execution of road works, Homefield-road, for the Urban District Council. Quantities by the Surveyor:—

Fry Bros.	£1,598 6 2	E. Peill & Sons	£1,325 9 4
R. Stockwell	1,472 13 12	S. Hudson, Streatham Hill Station, S.W. (accepted)	1,254 15 3
I. Mowlem & Co.	1,338 6 0		
T. Lawsbury	1,329 1 0		

[Surveyor's estimate, £1,175 15s. 8d.]

COVENTRY.—For the execution of water-supply works, Bedworth, for the Foleshill Rural District Council. Mr. H. B. Nichols, C.E., 59, Corporation-street, Birmingham:—

H. Holloway	£14,114 8 6	Clift Ford	£10,998 0 0
G. Law	13,284 0 0	J. Biggs	10,370 0 0
A. E. Nunn	11,600 0 0	Amos Jenkins, Southwell*	9,720 0 0
H. Shardlow	11,374 0 0		

* Accepted.

ELGIN (N.B.).—For additions to police station, Findhorn. Messrs. Reid & Wittet, architects, Elgin:—

Masonry.—John McKenzie, Forres	£150 13
Carpentering.—John Smith, Forres	
Plumbing and Slating.—Alex Forbes, Forres	
Plastering.—Robt. Cameron, Forres	
Painting.—C. W. Macdonald, Forres	
Heating Apparatus.—McKenzie & Moncur, Edinburgh	

GODALMING.—Accepted at a schedule of prices for redressing and repitching 1,500 yds. super granite roadway. Mr. J. H. Norris, Borough Surveyor, Church-street, Godalming:—
W. Griffiths, Bishopsgate-street, London.
Work to be done will amount to between £700 and £900

HALESOWEN.—For widening, &c., Coombs Holloway, Hill, for the Rural District Council. Mr. B. Perkins, surveyor, Halesowen. Quantities by surveyor:—

A. & A. Timmins	£1,614 0 0	J. Mackay	£593 18 2
Currall, Lewis, & Martin	967 8 0	T. Crumpton, Halesowen (accepted)	561 19 0

HASTINGS.—For additions to schools, Clive Vale, for the U.D. School Board. Messrs. Elworthy & Son, architects, London-road, St. Leonards:—

E. Midmer	£375 0	Bartor & Gasson	£326 19
W. Small	349 10	C. Harman (accepted)	317 0
J. Geary	345 0	A. Wood*	273 0

* Afterwards withdrawn.
[Architects' estimate, £342]

KENDAL.—Accepted for the erection of six dwelling houses, Stickland-place, for Messrs. Millward. Mr. John Hutton, architect, Kendal. Quantities by architect:—

Walling and Masoning.—W. Dixon & Son, Kendal	£1,710
Slating.—Jas. Bailey, Penrith	
Joinery and Carpentry.—Henry Collett, Kendal	
Plumbing.—John Hodgson, Kendal	
Painting and Glazing.—James Hine, Kendal	
Plastering.—Anderson Brothers, Kendal	

LONDON.—For granite and broken granite spalls, 1898-99, for the Vestry of Paddington. Mr. George Weston, Surveyor:—

	Broken Granite. per cubic yard.	Broken Granite. per ton.	Granite Lumps. per ton.	
	s. d.	s. d.	s. d.	
Alderney.				
G. Le Maitre, Delivered at side of Parish Wharves	17 0	—	—	For 2,500 yds.
L. Sommerfeld* do.	16 6	—	10 6	For 1,500 yds
Do. Delivered at Queen's Park or Kilburn Railway Depots	16 12	—	—	
Bierghes.				
Kaltenbach & Schmitz, Delivered at side of Parish Wharves	13 0	—	—	
Clee Hill.				
Clee Hill Granite Co., Delivered at Paddington Railway Depot	—	—	14 0	Machine-broken.
			14 6	Hand-broken.
Enderby.				
B. Nowell, & Co., Delivered at Kilburn Railway Depot	13 6	—	10 9	
Tildesley, Shepherd, & Mabson, Delivered at Queen's Park or Kilburn Ry. Depots	13 0	—	10 6	
Guernsey.				
E. & H. Beevers, Delivered at side of Parish Wharves*	16 2	—	—	
Wm. Griffiths, do.	18 6	—	11 3	
A. & F. Manuelle, do.	17 5	—	10 6	If machine-broken a lower price.
J. Mowlem & Co., do.	18 8	—	11 0	
L. Sommerfeld, do.	17 9	—	—	
Do. Delivered at Queen's Park or Kilburn Railway Depot	18 1	—	—	
Narborough.				
B. Nowell & Co., Delivered at Kilburn Railway Depot	14 6	—	11 0	
Tildesley, Shepherd, & Mabson, Delivered at Queen's Park or Kilburn Ry. Depots*	14 0	—	10 9	From Narborough and Enderby Quarries. For 3,000 tons.
E. J. Van Praagh & Co., do. do.	11 3	—	—	
Quenast.				
C. M. Manuelle, Delivered at side of Parish Wharves	14 0	—	—	
Whitwick.				
Whitwick Granite Co., Delivered at Kilburn Railway Depot	11 4	—	—	For 3,000 tons, machine-broken.

* Accepted.

LONDON.—For paving, 1898-99, for the Vestry of Paddington. Mr. George Weston, Surveyor:—

	Footway Kerb. 12 in. × 8 in. Aberdeen. Stra'ght per ft. run.	Aberdeen. C'rcular per ft. run.	Norway. Stra'ght per ft. run.	Norway. C'rcular per ft. run.	Footway Kerb. 6 in. × 12 in. Aberdeen. Stra'ght per ft. run.	Aberdeen. C'rcular per ft. run.	Norway. Stra'ght per ft. run.	Norway. C'rcular per ft. run.	Yorkshire Paving. Squared. 2½" per ft. super	Squared. 3" per ft. super	Unsquared. 2½" per ft super	Unsquared. 3" per ft super
W. Griffiths	s. d. 2 3	s. d. 2 6	s. d. 2 1	s. d. 2 4	s. d. 2 1	s. d. 2 4	s. d. 1 10½	s. d. 2 1½	d. 10½	d. 11½	d. 10	d. 10½
J. Mowlem & Co.	2 3	2 5	2 0	2 2	2 1	2 3	1 10	2 0	10½	11½	9½	10½
Nowell & Co.*	2 2	2 5	1 11	2 2	1 11½	2 2½	1 8½	1 11½	—	—	—	—
E. Rogers & Co.	2 3½	2 6	2 1½	2 4	2 1½	2 4	2 0	2 2½	10½	11½	9½	10½
Southwram Stone Co.*	—	—	—	—	—	—	—	—	9½	10	8½	9½
Tildesley, Shepherd, & Mabson	2 4	2 6	2 1	2 3	2 2	2 4	1 11	2 1	10½	11½	10	10½
S. Trickett & Sons	2 3	2 6	2 0	2 3	2 1	2 4	1 10	2 1	10*	11½	9½	10½
G. Wimpey & Co.	2 4	2 6	2 0	2 3	2 2	2 4	1 10	2 0	10½	11½	9½	10½
Patent Victoria Stone Co.	—	—	—	—	—	—	—	—	Patent Victoria Stone Co 2 in. 7	—	—	—

	New Granite Paving Blocks or Cubes. Enderby. 5"×6" Per ton.	4"×4" Per ton.	3"×6" Per ton.	Narborough. 5"×6" Per ton.	4"×4" Per ton.	3"×6" Per ton.	Mountsorrel. 5"×6" Per ton.	4"×4" Per ton.	3"×6" Per ton.	Aberdeen. 5"×6" Per ton.	4"×4" Per ton.	3"×6" Per ton.
W. Griffiths	s. d. 29 6	s. d. 33 0	s. d. 34 6	s. d. 29 6	s. d. 33 0	s. d. 34 6	s. d. 31 6	s. d. 34 0	s. d. 35 0	s. d. 31 0	s. d. 37 6	s. d. 38 6
J. Mowlem & Co.	29 6	33 0	34 6	29 6	33 0	34 6	31 0	34 0	35 0	30 0	38 0	38 6
Nowell & Co.*	28 10	32 0	33 9	28 10	32 0	33 9	29 0	32 6	34 3	31 0	38 0	38 0
E. Rogers & Co.	29 6	34 0	36 0	29 6	34 0	36 0	29 6	34 0	36 6	32 0	38 0	39 0
Southwram Stone Co.*	—	—	—	—	—	—	—	—	—	—	—	—
Tildesley, Shepherd, & Mabson	32 0	34 0	36 0	32 0	34 0	36 0	31 0	35 0	37 0	32 0	38 0	39 0
S. Trickett & Sons	29 0	32 0	34 0	29 0	32 0	34 0	29 0	32 0	34 0	32 0	38 0	39 0
G. Wimpey & Co.	29 0	34 6	36 0	29 0	34 6	36 0	29 6	34 6	35 0	32 0	38 0	39 0
Patent Victoria Stone Co.	Delivered at any G.W.R. Depot in Paddington.											

CONTRACT PRICES, 1897-98.

Nowell & Robson	s. d. 2 0	s. d. 2 3	s. d. 1 8	s. d. 1 11	s. d. 1 10	s. d. 2 1	s. d. 1 6	s. d. 1 9	d. 9½	d. 11½	d. 8½	d. 9½	s. d. 27 0	s. d. 28 6	s. d. 30 0	s. d. 27 0	s. d. 28 6	s. d. 30 0	s. d. 28 0	s. d. 29 6	s. d. 30 0	s. d. 29 6	s. d. 35 0	s. d. 35 0

* Accepted.

KNARESBOROUGH.—For the execution of private street works, for the Rural District Council. Mr. R. Annakin, Surveyor, 44, Station-parade, Harrogate :—

I. Speight	£1,980 0 0	G. Parsons	£1,545 8 6
F. U. Simpson	1,651 5 7	A. Eshelby, Star-beck, Harrogate*	1,406 4 6
W. Annakin	1,598 15 0		

* Accepted.

LEEDS.—For the erection of shop premises, Burmantofts-street, for Mr. Hudson. Mr. J. W. Thackray, architect, 3, Rossington-place, Gathorne-terrace, Leeds :—

Excavating, Bricklaying, and Masonry.
J. T. Wright, Hartley Hill, Leeds
Carpentry and Joinery.
Wood & Smith, King's-avenue, Leeds
Ironfoundery.
Bagshawes, Victoria Foundry, Batley
Slating.
Pickles Bros., Park-lane, Leeds
Plastering.
John Jackson, 80, Cameron-street, Leeds
Plumbing.
T. Story & Co., Cookridge-street, Leeds
Painting.
Roylance & Horsman, Bagley-road, Leeds

£1,672 17 9

LONDON.—For rebuilding No. 18, Old Cavendish-street Oxford-street, W. :—

Goodson	£2,933
W. Holt & Sons, Croydon (accepted)	2,875

LONDON.—For pulling down and rebuilding the "Earl of Chatham" public-house, Thomas-street, Woolwich :—

Kirk & Randall	£3,600	Thomas & Edge	£3 369
Mundry & Son	3,500	Proctor	3,352
H. L. Holloway	3,448	Chapman	2,969
Sanford & Co.	3 399		

LONDON.—For making-up Palmerston, Marlborough, Granville, and Pymmes-roads, Bowes Park, for the Southgate Urban District Council. Mr. C. G. Lawson. Surveyor, Council's Offices, Palmer's Green, N. Quantities by Messrs. Lee & Sons, Craven-street, W.C. :—

E. & A. J. Nicholls	£5,107 3 3	Clift Ford	£4,714 0 0
Fry Bros.	5,068 7 3	Wm. Griffiths	4,668 14 8
F. A. Jackson & Son	4,819 0 0	Thos. Adams, Wood Green (accepted)	4 550 14 5
George Bell	4,767 0 0		

LONDON.—For extension of premises at 313, Kentish Town-road, for Mr. Baldry. Mr. Walter Balling, architect, 7, John-street, Adelphi, W.C. :—

Marchant & Hirst (accepted) £669

LONDON.—For alterations in stables, at various fire stations, for the London County Council :—

Woolwich Station.

G. Parker	£170 0 0	F. Grant	£115 0 0
H. Line	150 0 0	H. J. Stephens*	103 0 0

Shooter's Hill Station.

G. Parker	£120 0 0	F. Grant	£75 0 0
H. Line	77 0 0	H. J. Stephens*	60 0 0

West Norwood Station.

H. Cooke	£104 15 0	R. Harding & Son*	£78 7 6
J. Bowyer & Co.	83 0 0		

* Accepted.

LONDON.—For the reconstruction of the Holborn branch of the Fleet sewer, for the London County Council :—

J. H. Neave	£14,469 17 3	J. Dickson	£12,933 9 1
T. Adams	13,763 2 9	J. Mowlem & Co.	10,688 0 0
Pedrette & Co.	13,311 16 3	E. Iles	10 392 15 0
F. A. Jackson & Son, Limited	13,299 2 9	C. W. Killingback & Co.	9 978 13 5

NAVAN (Ireland).—For the construction of water supply works, for the Town Commissioners. Mr. J. H. Swiney, engineer, Avenue Chambers, Belfast. Quantities by engineer :—

Hugh R. Blackburn	£7,384	Michael Delany	£6,624
Heggarty & Gault	6,585	Wm Baird	5,926
Jno. Cunningham	6,685	Jno. McNally	5 780
Chas. J. Quirks	6,598	Wm. McLarnon, Belfast*	5,601
R. S. Barnes	6,245		

* Accepted.

ST. CYRUS (N.B.).—Accepted, on schedule of prices, for the construction of water supply works. Mr. John Sim, Engineer, 160, High-street, Montrose, Quantities by the Engineer :—

James L. Warden, Montrose, N.B.

SOUTHALL (Middlesex).—For proposed new road, Middleton Building Estate :—

H. Morecroft	£2,240 0 0	G. Bell	£1,437 0 0
G. Osenton	1,815 0 0	W. H. Wheeler	1 428 0 0
W. Langridge	1,760 0 0	G. Wimpey	1,380 0 0
W. B. Hanson	1 778 0 0	H. Lee	1 365 19 8
J. Macklin	1,704 0 0	Lawrence & Shacker	1,310 0 0
S. Kavanagh	1,666 0 0	H. Woodham, 12, Blackheath Hill, S.E.*	1,299 0 0
H. Hill	1,576 0 0		
W. Swaker	1,450 0 0		
H. Bentham & Co.	1,449 0 0		
T. Adams	1,449 0 0		

* Accepted.

WILLENHALL (Staffs).—For the execution of drainage works, Bentley, for the Willenhall Urban District Council. Mr. C. J. Jenkin, C.E., Town Hall, Willenhall :—

Geo. Law	£318	Cursall, Lewis, & Martin, Birmingham*	£207
Herbert Holloway	268		
James Owens	250		

* Accepted.

[Engineer's estimate, £204 12s.]

WITHAM (Essex).—For sanitary and plumbing work at Witham School, for the Managers of the South Metropolitan School District :—

W. Rogers	£480 0 0	N. Farrow	£375 0 0
Joslins, Limited	436 11 7	Crikall & Winterton	333 0 0
W. Grisley & Son	410 0 0	Joseph Smith & Son	319 0 0
Arthur H. Inns	398 0 0	J. Knight & Son	277 0 0
Ernest West	380 0 0	J. Gamble (accepted)	244 10 0

Alterations, &c., Jasper House, Earl's Court-road.—In our last issue an error occurred in the names of the accepted contractors for this work. The style of the firm is Messrs. Lole & Lightfoot, not Sole & Lightfoot.

TO CORRESPONDENTS.

"CIVIL ENGINEER" (No notice is taken of anonymous communications; nor are they read).—R. & W., J. F. W. (Amounts should have been stated). P. C. B. (Too late: next week).

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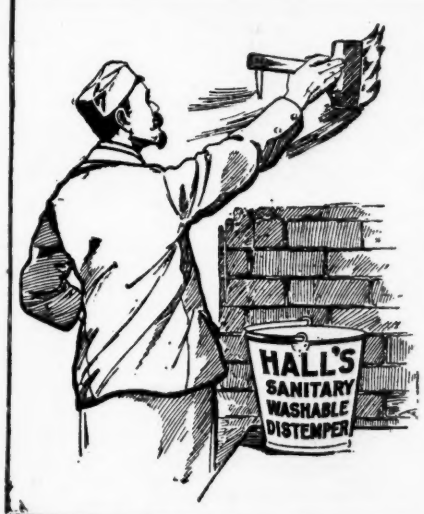

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Late The Boiler Insurance and Steam Power Co., Lim.
The Original Boiler Insurance Company.)
Head Office: 67, King Street, Manchester.
ESTABLISHED 1859.
Subscribed Capital - - £375,000.
Boilers and Engines Insured and Inspected.
Employers Insured against Claims under "The Employers' Liability Act."
Joint Policies Issued. Individual Accident Insurance.
Upwards of 40,000 *Boilers & Engines under supervision.*
J. F. L. CROSLAND, M.Inst.C.E., M.Inst.M.E., Chief Engineer.
EDWARD HADFIELD, Secretary.
Application for Agencies Invited.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, 'THE BUILDER,' LONDON.

THE INDEX and TITLE-PAGE for VOLUME LXXIII. (July to Dec. 1897) were given as a supplement with the number for Jan. 8 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each, and

THE SEVENTY-THIRD VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence, is now ready.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all sums should be remitted by Cash in Registered Letter or by Postal Orders, payable to DOUGLAS FOURDRINIER, and addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office*, 46, Catherine-street, Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to the advertiser the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH, By Post (carefully packed) 1s.

"THE BUILDER" STUDENT'S SERIES.
Just Published.—Crown 8vo, price 5s. post free.
CARPENTRY and JOINERY.
A TEXT-BOOK FOR ARCHITECTS, ENGINEERS, SURVEYORS, AND CRAFTSMEN.
Fully Illustrated and Written by
BANISTER F. FLETCHER and H. PHILLIPS FLETCHER.
London:
D. FOURDRINIER, "Builder" Office, 46, Catherine-street, W.C.

BILLS OF QUANTITIES, &c.
LITHOGRAPHED CORRECTLY BY RETURN OF POST. A LIBERAL DISCOUNT OFF USUAL PRICES.
PLANS BEST STYLE.
J. L. ALLDAY,
Shakespeare Press, Birmingham.

For Framing, 34 in. by 13 in., price 5s., by post 5s. 4d.
MEDIÆVAL OXFORD.
A Bird's-eye View, drawn by H. W. BREWER, with key and descriptive pamphlet.
London:
D. FOURDRINIER, "Builder" Office, 46, Catherine-street, W.C.

Now Ready. 800 pages. Price 4s. (post-free).
Lockwood's Builder's Price Book for 1898.
A Comprehensive Handbook of the Latest Prices and Information by FRANCIS MILLER, A.R.I.B.A. With a SUPPLEMENT containing the LONDON BUILDING ACT, and other ENACTMENTS, BY-LAWS, &c., and an INTRODUCTION, and NOTES OF ALL IMPORTANT DECISIONS in the SUPERIOR COURTS. Edited by A. J. DAVID, LL.M.
London: CROSBY LOCKWOOD & SON,
No. 7, Stationers' Hall-court, E.C.

ROYAL INDIAN ENGINEERING COLLEGE, Cooper's Hill, Staines.—The course of study is arranged to fit an engineer for employment in Europe, India, and the Colonies. About 40 students will be admitted in September, 1898. The Secretary of State will offer them for competition 12 appointments as assistant engineers in the Public Works Department, and three appointments as assistant superintendents in the Telegraphic Department, one in the Accounts Branch P.W.D. and one in the Traffic Department. Indian State Railways.—For particulars apply to SECRETARY at College.

SANITARY INSPECTORS' and PRACTICAL SANITARY SCIENCE EXAMS. of THE SANITARY INSTITUTE. Complete Courses of Instruction by correspondence for these and similar exams. conducted by Gentleman (Engineer, Surveyor, and Sanitary Inspector to Urban District Council) holding three Certificates from San. Inst. 1st Class Honours Medallist, Hygiene, &c. Several hundred successes. Classes for 1897 EXAMS. just commencing.—Apply early for Syllabus of Subjects, &c. to MEM. SAN. INST. Box 195, Office of "The Builder."

SANITARY INSTITUTE EXAMS.—Preparation for the Inspectors' Examination under a system of correspondence needing no Text Books or Acts, and for the Exam. in Practical Sanitary Science, by C. H. CLARKE, Assoc.San.Inst. Member of the Société Française d'Hygiène, 1st Honoursman and Medallist in Hygiene, Member of the Society of Arts, Professional Lecturer on Sanitation. Clarke's methodical and reliable "Aids": —"Notes on Sanitary Law," 1s. 6d. "Sanitary Appliances" (diagrams), 1s. "Trade Nuisances," 6d. "Practical Drain Inspection," 6d. "Calculation of Cubic Space," 1s.—Prospectus from 13, Albert-road, Ilford, E.

SURVEYORS' INSTITUTION EXAMINATIONS.—Complete courses of preparation in class or by correspondence for the Professional Associateship and Fellowship in all sub-divisions. Mr. PARRY'S courses have been conducted continuously for seven years with increasing success. At the last three examinations the following prizes were obtained:—
1895 Institution Prize, Driver Prize, and Penfold Silver Medal.
1896 Institution Prize, Driver Prize, and Penfold Silver Medal.
1897 Institution Prize and Special Prize.
At each of the two last NEARLY ONE-HALF of the total number of successful candidates were prepared by Mr. PARRY. All pupils receive Mr. PARRY'S personal attention and teaching.—Apply to Mr. RICHARD PARRY, F.S.I. A.M.I.C.E. &c. 27, Great George-street, Westminster (immediately opposite the Surveyors' Institution).

R.I.B.A. EXAMS. — PREPARATION personally or by correspondence, in three, six, nine, or twelve months' courses. Any subject taken separately. Special three months' course for any of the Exams. at reduced rate.—For full particulars apply to Mr. W. CHURCH HOWGATE, A.R.I.B.A. Perchard House, 70, Gower-street, W.C. (close to British Museum).

SANITARY INSPECTORS. — EXAMINATIONS for qualification under the SANITARY INSTITUTE. A Qualified Surveyor, and holder of certificates of competency in sanitary knowledge and building construction, is prepared to COACH ladies and gentlemen for these Exams. by correspondence. Fees entirely conditional on the pupil's success payable after passing, bar a nominal guarantee of good faith.—GEO. B. DAFFORN, F.A.S.I. 25, High-street, Wimbledon.

SANITARY INSPECTORS' EXAMINATIONS.—A Surveyor, Assoc. San. Inst. F.I.S.E. certified by the Sanitary Association of Scotland, thoroughly PREPARES CANDIDATES for SANITARY INSTITUTE and other Exams. by correspondence. No books required. Numerous recent successes.—Particulars and testimonials, apply M. S. A. 31, Herbert-road, Plumstead.

R.I.B.A. Society of Architects, Surveyors' Institute (Building Section), and Civil Service Technical EXAMINATIONS. Preparation by correspondence, personally, or in residence. First place secured fourteen times. — G. A. T. MIDDLETON, 19, Craven-street, Strand, W.C.

MUNICIPAL and COUNTY ENGINEERS' EXAMINATION. — Mr. RICHARD PARRY, A.M.I.C.E., F.S.I., &c., 27, Great George-street, Westminster, prepares pupils by correspondence for this examination. The course of work may be taken to extend over three, six, or twelve months, according to previous knowledge. At the examination of last April, out of the 15 successful candidates 12 were prepared by Mr. Parry.

QUANTITIES, &c.—WANTED, lessons in taking out quantities estimates, &c. Evenings.—Please reply, stating terms, to A. E. HAYWARD, 39, Upper East Smithfield.

YOUNG ARCHITECT, A.R.I.B.A., DESIRES to ASSIST others in the PREPARATION of DRAWINGS at his own office.
G. SCORER, 28, Newman-street, W.

ARCHITECTURAL ASSISTANCE. Messrs. KING & BROMLEY desire to ASSIST OTHERS in the PREPARATION of DRAWINGS at their own Office.
No. 52, LINCOLN'S INN FIELDS, W.C.

DESIGNING FOR GLASS.—Old, well-established firm in Germany wishes to communicate with first-class DESIGNER for CARTOONS for Church Windows. Constant employment guaranteed to first-rate artist.—Applications, stating terms per square inch for sketches and square foot for cartoons under, Box 190, Office of "The Builder."

PURSUANT to a Judgment of the High Court of Justice Chancery Division made in an action in the matter of the ESTATE of THOMAS QUINN deceased Ransom against Moss and others 1897 Q 2466 the CREDITORS of Thomas Quinn late of St. Alban's Mansions Kensington Court Gardens in the County of Middlesex Builder who died on the 3rd day of November 1897 are on or before the 1st day of MARCH 1898 to send by post prepaid to ALFRED ERNEST WARD of 7 King-street Cheapside in the City of London a member of the firm of Ward Bowie & Co. of the same place the Solicitors of the Defendants William Moss and Charles Ash Hacker the Executors of the said deceased their Christian and surnames addresses and descriptions the full particulars of their claims a statement of their accounts and the nature of the securities (if any) held by them or in default thereof they will be peremptorily excluded from the benefit of the said Judgment. Every creditor holding any security is to produce the same before Mr. Justice Stirling at his Chambers the Royal Courts of Justice London on TUESDAY the 8th day of MARCH 1898 at TWELVE o'clock noon being the time appointed for adjudicating on the claims.

Dated this 31st day of January 1898.
WARD, BOWIE & CO.
No. 7 King-street Cheapside E.C.
Solicitors for the said William Moss and Charles Ash Hacker.

PATENTS, DESIGNS, and TRADE MARKS ACTS, 1883 to 1888.

Notice is hereby given that ERNST EMANUEL EDUARD MARTENS, of Heustadt (Holstein). Germany, Pharmaceutical Chemist, has applied for leave to AMEND the SPECIFICATION of the Letters Patent, No. 17370 of 1896, for a new or improved process for the preparation of liquid glue for joiners, upholsterers, and the like.

Particulars of the proposed amendments were set forth in the Illustrated Official Journal (Patents), issued on the 26th January, 1898.

Any person or persons may give notice of opposition to the amendment (on Form G) at the Patent Office, 25, Southampton-buildings, London, W.C. within one calendar month from the date of the said Journal.

C. N. DALTON, Comptroller-General.
PHILLIPS & LEIGH, 22, Southampton-buildings, London, W.C. Engineers and Patent Agents,

CALIFORNIA UNIVERSITY COMPETITION.—An Architect, A.R.I.B.A. desires to JOIN another, on mutual terms, with the above competition, or would give SERVICES to established Architect intending to compete. See particulars at R. I. B. A. Conduit-street.—Box 223, Office of "The Builder."

IRONMONGERY.—LONDON COMMISSION AGENCY WANTED. Builders' connexion. Large stocking premises. West End.—K. G. W, Box 677, Sell's Offices, 167, Fleet-street, E.C.

BOROUGH of DERBY.
BOROUGH ENGINEER AND SURVEYOR.

The Corporation invite APPLICATIONS for the Post of BOROUGH ENGINEER and SURVEYOR.

Salary, 600l. per annum, increasing by 50l. per annum to 750l.

The Corporation provide offices, assistants, instruments, and stationery.

The person appointed to devote the whole of his time to the duties of the office. An abstract of the principal duties and conditions of appointment may be obtained on application to the undersigned.

Applications, stating age, present occupation, and qualifications, with copies of not more than three recent testimonials, to be sent or delivered to the undersigned, endorsed "Borough Engineer and Surveyor," not later than SATURDAY, 12th FEBRUARY, 1898.

H. F. GADSBY,
Town Clerk.

Town Hall, Derby,
January 18th, 1898

ST. LUKE, MIDDLESEX, VESTRY.
APPOINTMENT OF SUPERINTENDENT OF SCAVENGING AND CLEANSING DEPARTMENT.

The St. Luke, Middlesex, Vestry invite APPLICATIONS from competent persons for the Office of SUPERINTENDENT of the SCAVENGING and CLEANSING DEPARTMENT.

The duties which will devolve upon the Superintendent relate generally to the cleansing and watering of the streets, and the removal and disposal of the house, trade, and other refuse of the Parish, and the charge and management of the wharves and dust destructor.

The Superintendent will be required to reside in the Parish.

The Officer appointed must possess practical acquaintance with the management and direction of workmen, and be a strict disciplinarian.

The salary will be 200l. rising to 250l. per annum by annual increments of 10l.

The ages of the Candidates will be limited to between 30 and 45 years.

Forms of application for the appointment and list of duties may be obtained upon application (if by letter the envelope should not be marked, and should be accompanied by a stamped directed envelope).

The application must be made upon the printed forms before mentioned (which alone will be recognised), and these must be endorsed outside "Application for Superintendent," and should reach me not later than 12th FEBRUARY, inst.

Candidates may be required to attend the Committee of Selection and also the Vestry, but travelling expenses only will be paid.

Canvassing, directly or indirectly, will disqualify any Candidate.

By order of the Vestry.
GEORGE WHITEHEAD PRESTON,
Clerk to the Vestry.

Vestry Clerk's Office,
St. Luke's Vestry Hall, City-road, E.C.
January 28th, 1898.

TOTTENHAM URBAN DISTRICT COUNCIL.

WANTED a CLERK of WORKS, experienced in drainage and roadmaking.

Salary 2l. 10s. per week.

Applications, with not more than three testimonials, to be delivered to Mr. P. E. MURPHY, Engineer to the Council, not later than TWELVE noon, on TUESDAY, 15th of FEBRUARY, 1898.

E. CROWNE,
Clerk of the Council.

Offices,
No. 712, High-road,
Tottenham.
February 4th, 1898.

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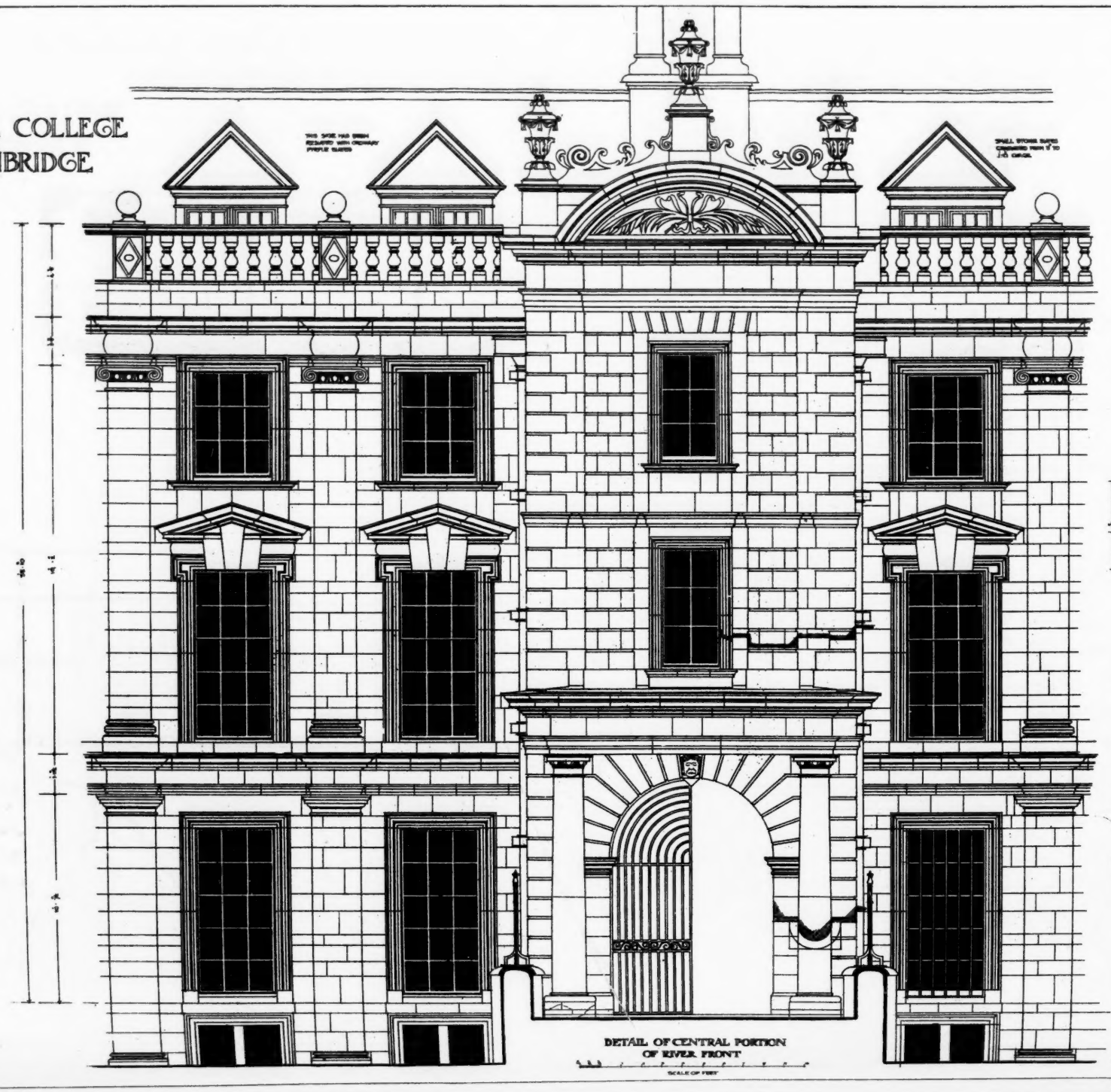
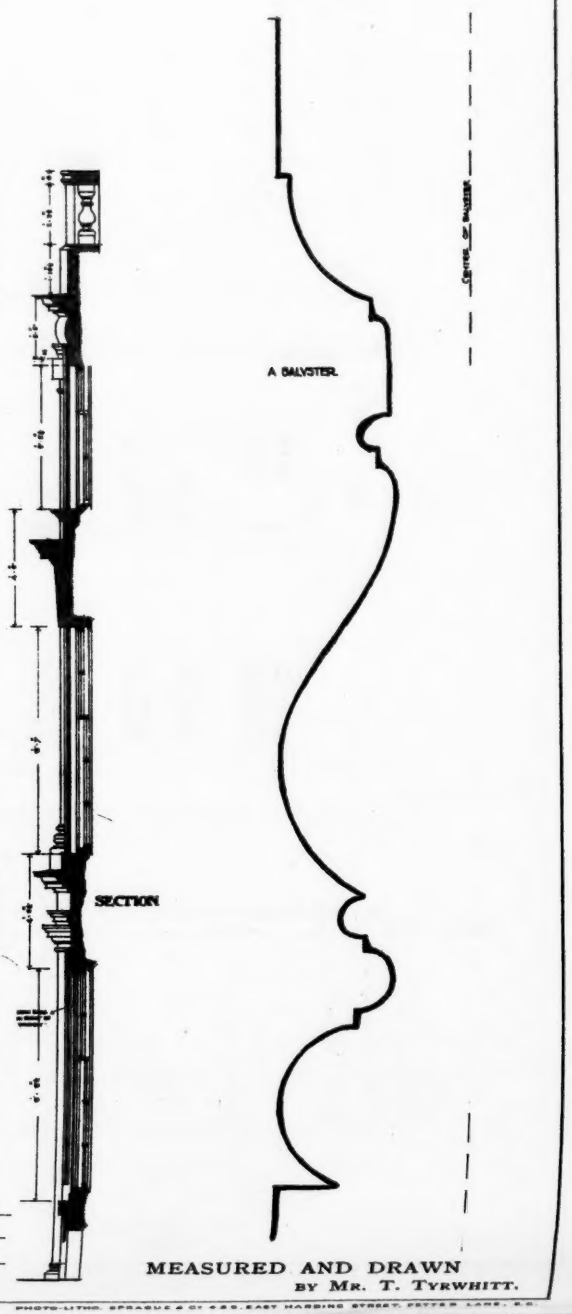
CLARE COLLEGE CAMBRIDGE



DETAIL OF CENTRAL PORTION OF RIVER FRONT

SCALE OF FEET



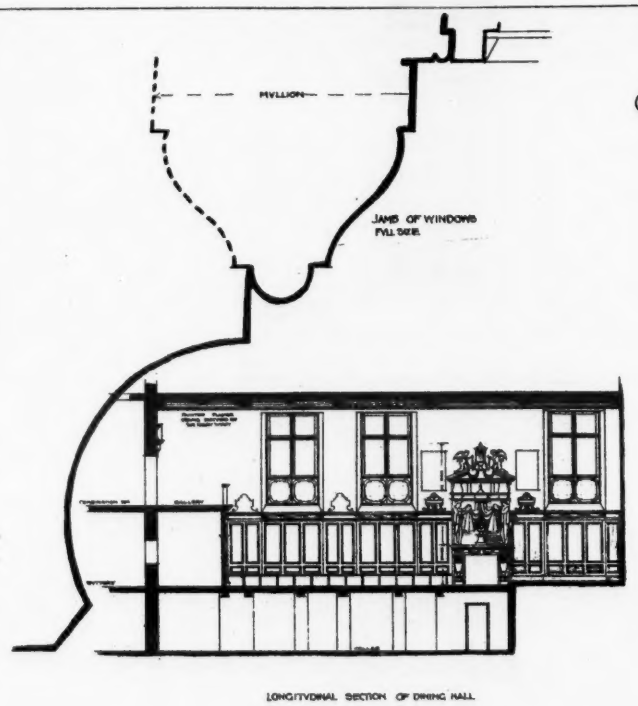
SECTION

A BALUSTER.

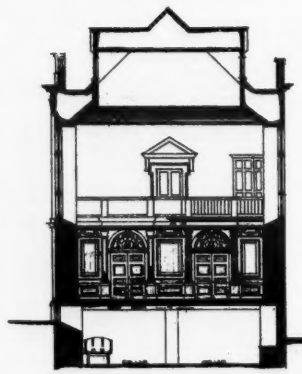
MEASURED AND DRAWN
BY MR. T. TYRWHITT.

PHOTO-LITHO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

CLARE COLLEGE CAMBRIDGE

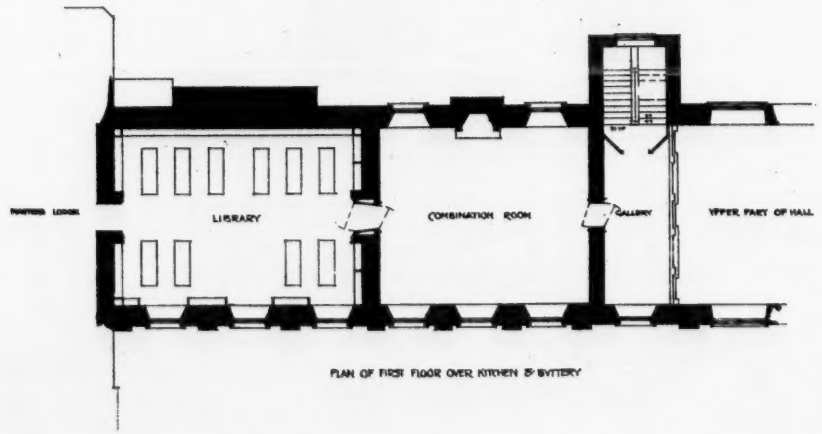


LONGITUDINAL SECTION OF DINING HALL.



CROSS SECTION OF HALL SHOWING BUTTERY SCREEN

SCALE OF FEET

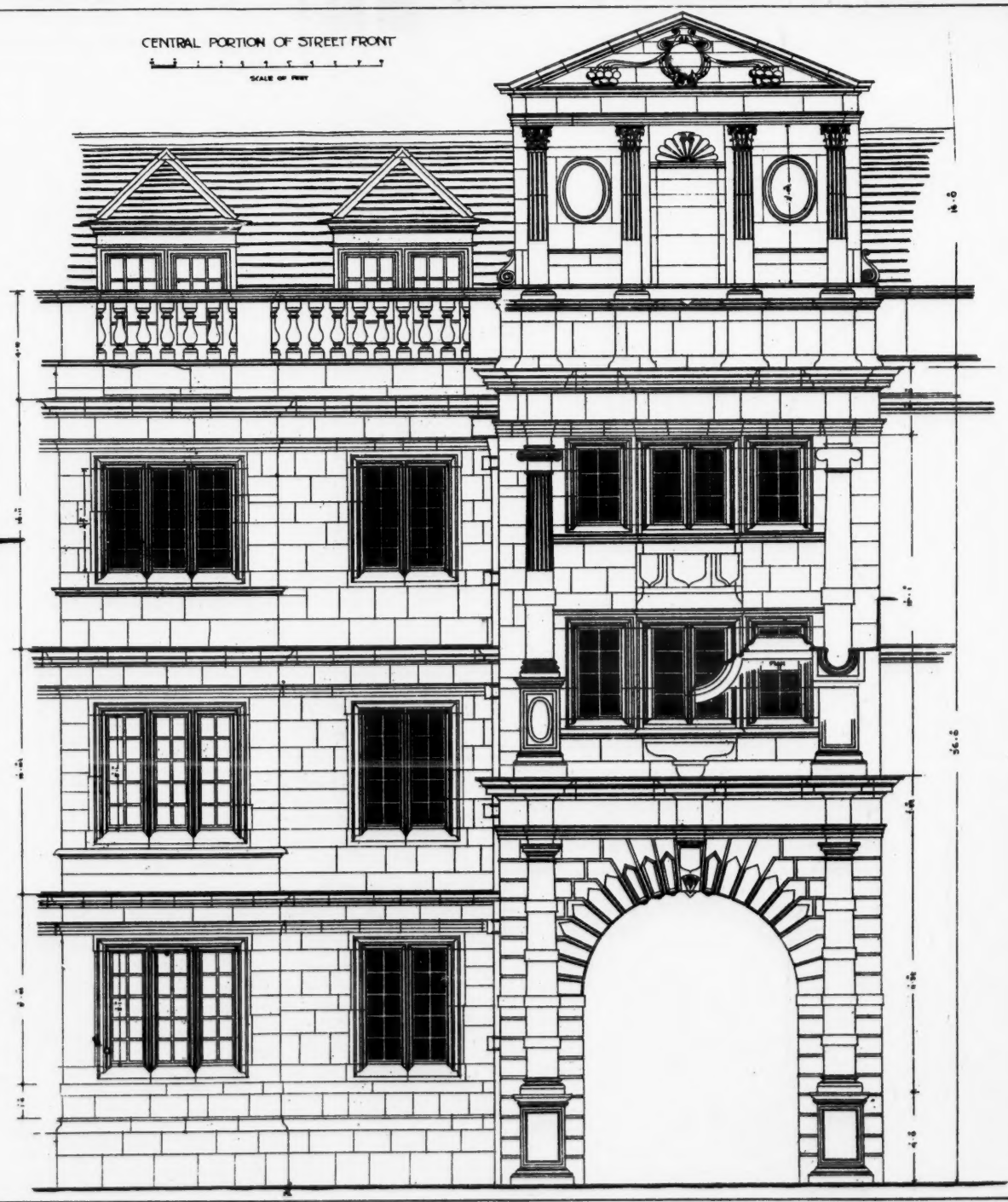


PLAN OF FIRST FLOOR OVER KITCHEN & BUTTERY

MEASURED AND DRAWN BY MR. T. TYRWHITT.

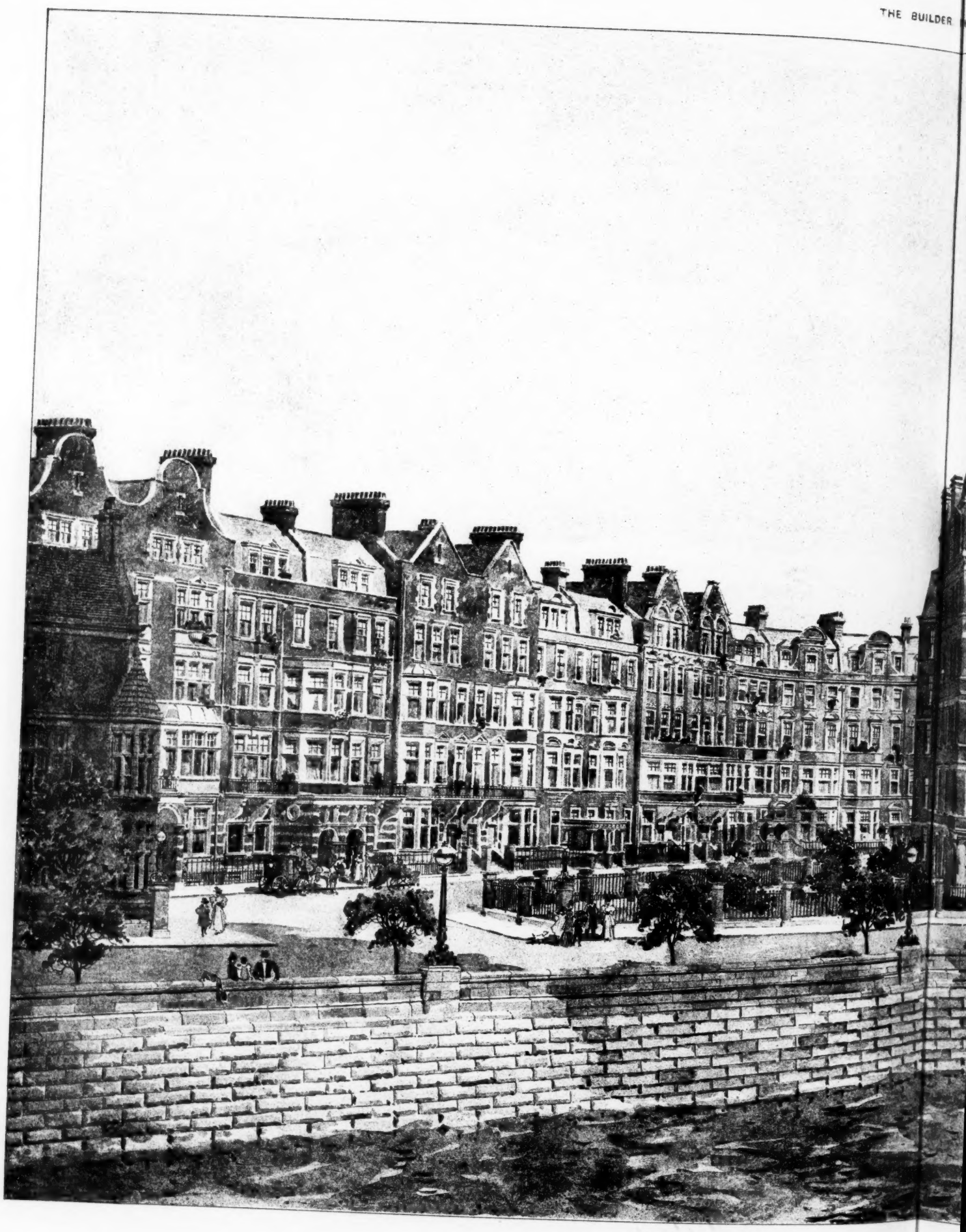
CENTRAL PORTION OF STREET FRONT

SCALE OF FEET



R.I.B.A. Medal, 1898.

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

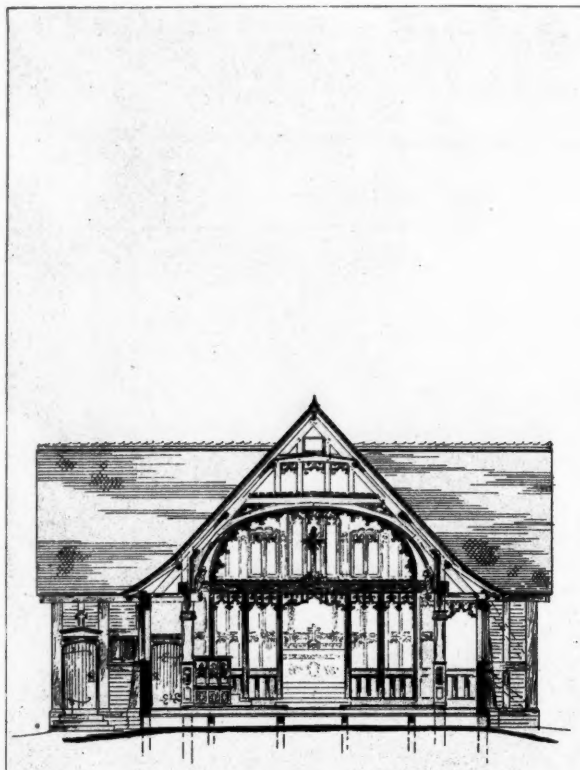


HOUSES AND FLATS, CHELSEA EMBANKMENT.—M

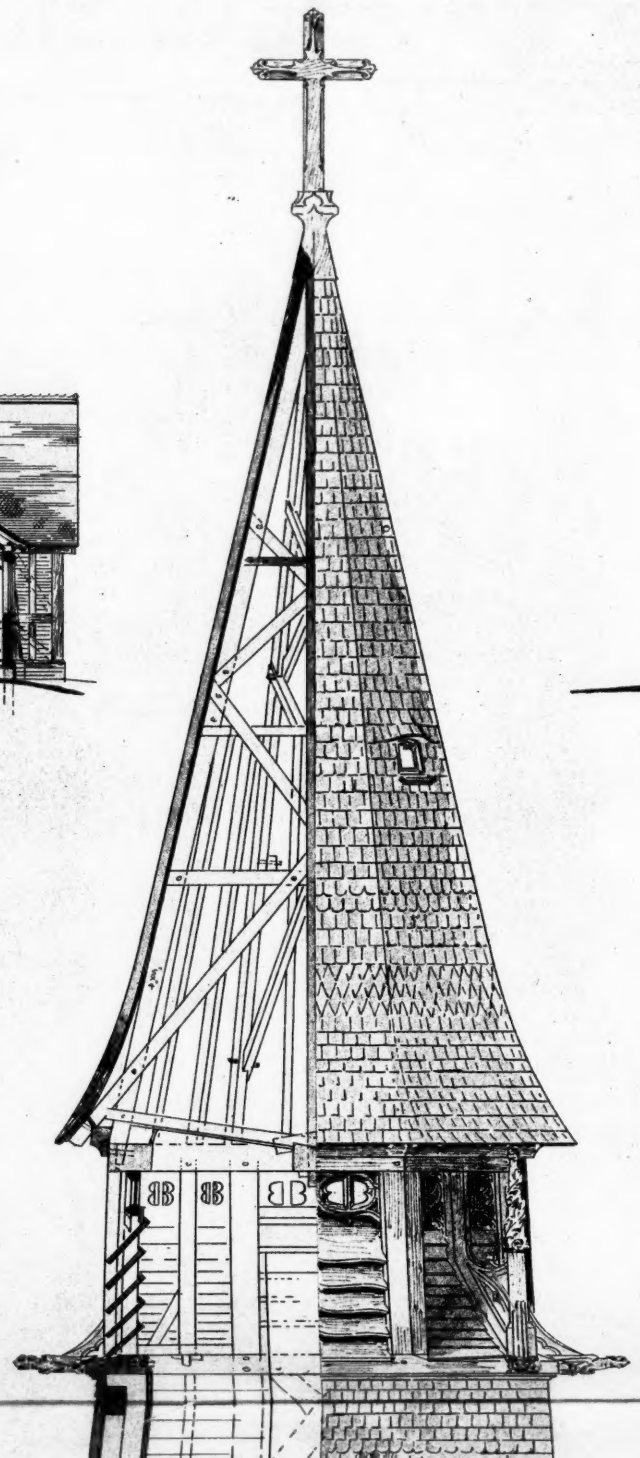
INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET FETTER LANE, E.C.

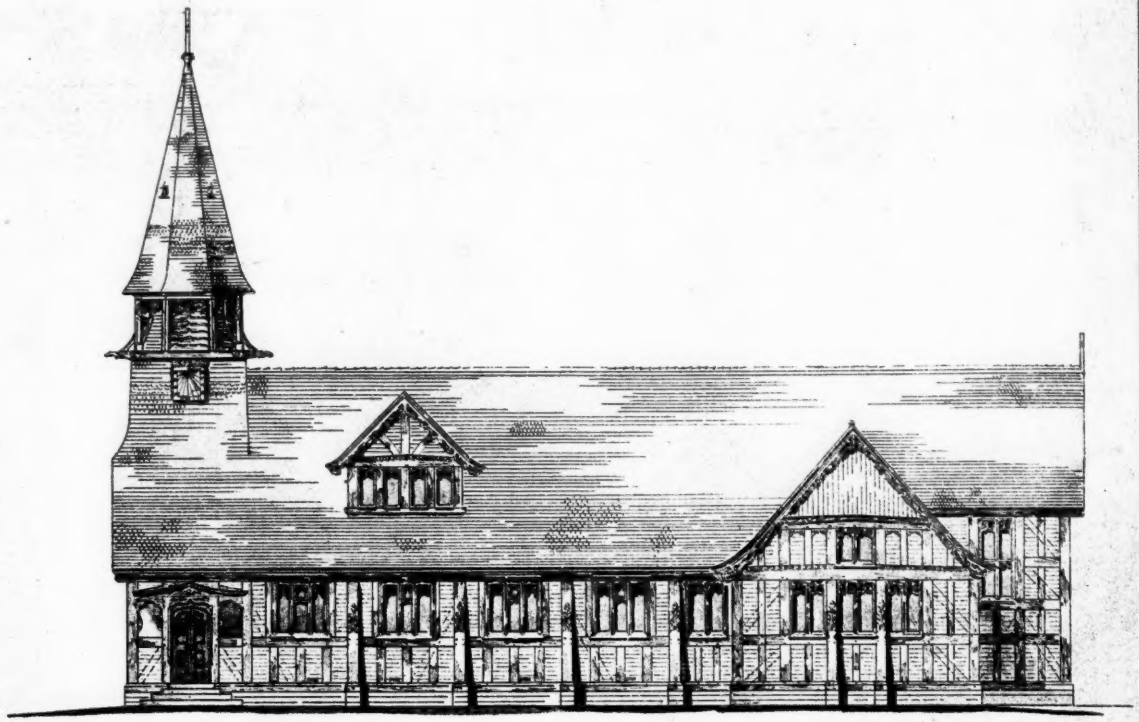
EMBANKMENT.—Mr. Delissa Joseph, F.R.I.B.A., Architect.

GENERAL LIBRARY,
UNIV. OF MICH.
16 FEB 1898



Cross Section AB.

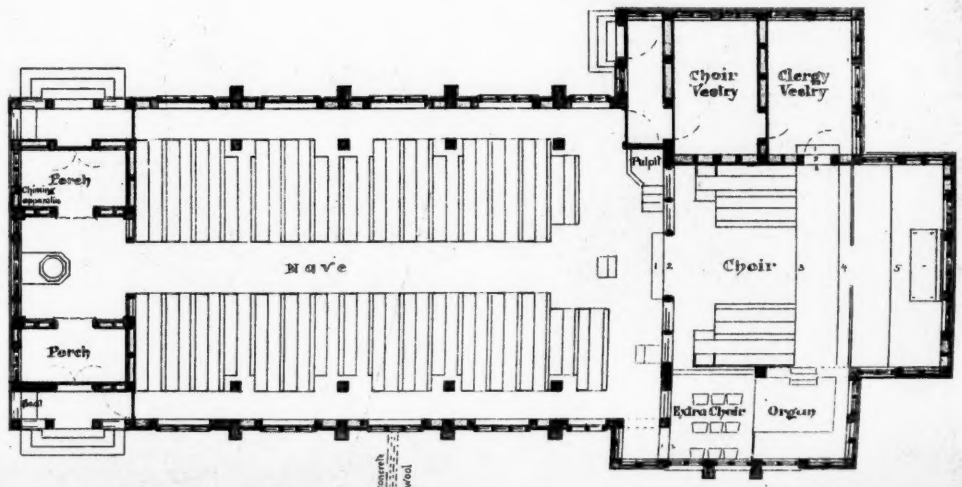




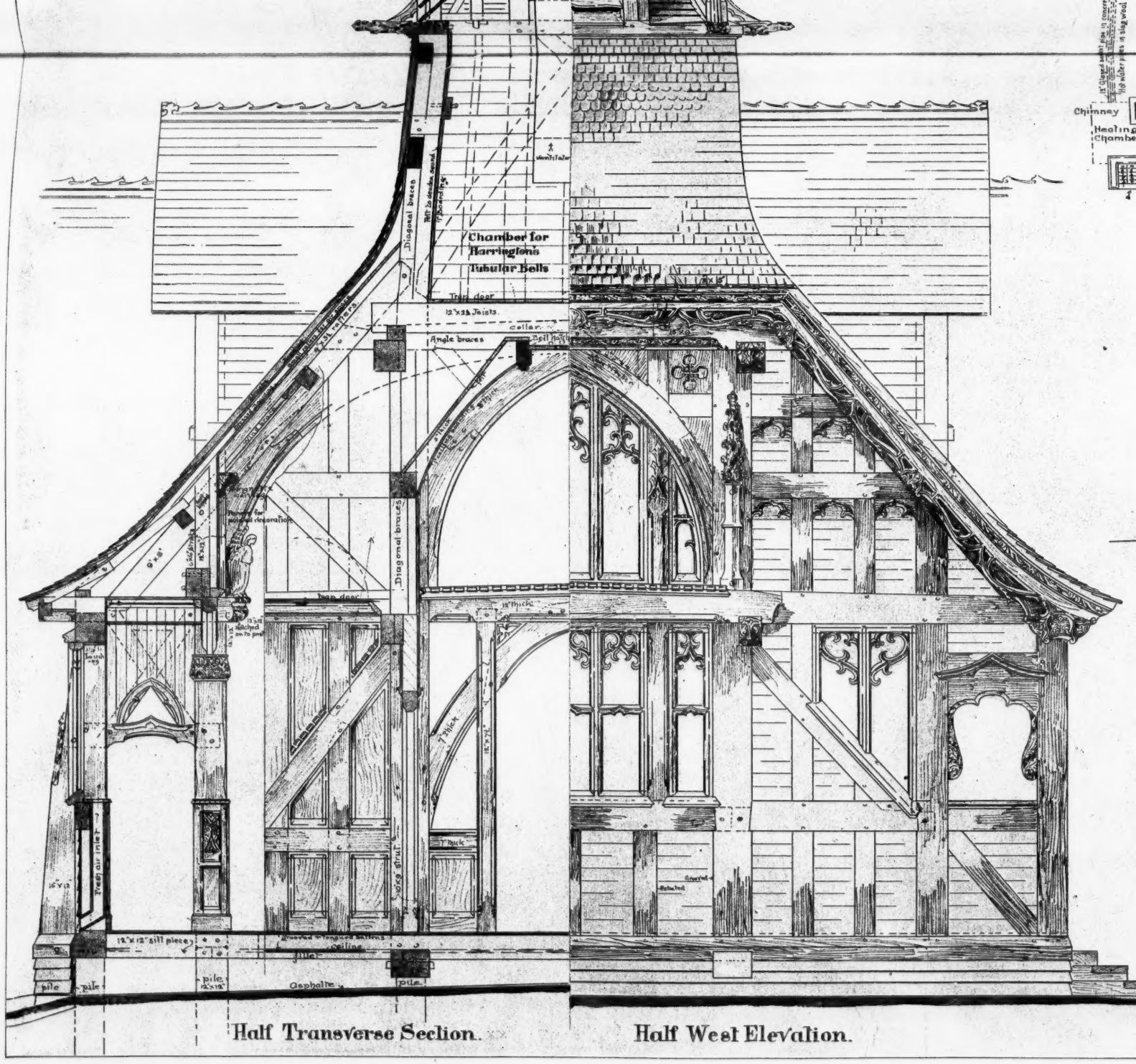
South Elevation.

Accommodation :–

Nave	173	Sittings
Choir	18	"
Female choir or Orchestra	9	"
Total	200	"

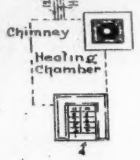


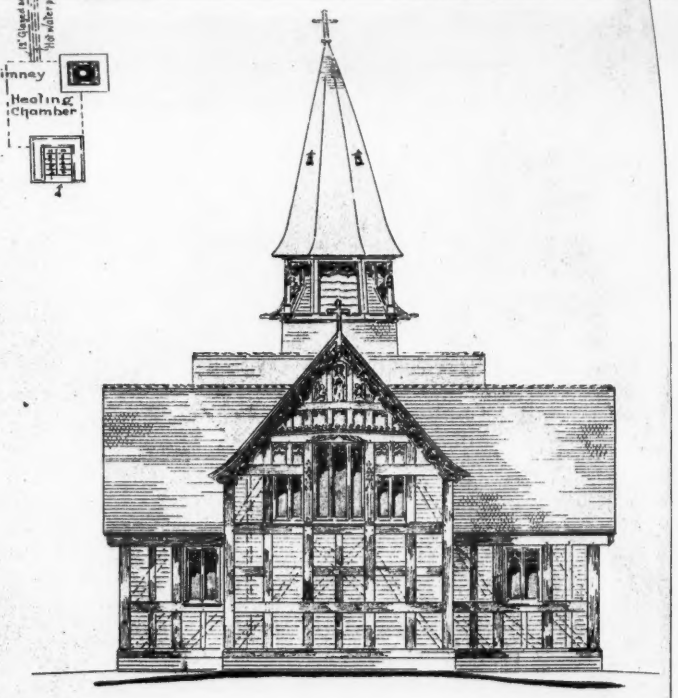
Plan.



Half Transverse Section.

Plan





East Elevation.

Half West Elevation.

INK-PHOTO. SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

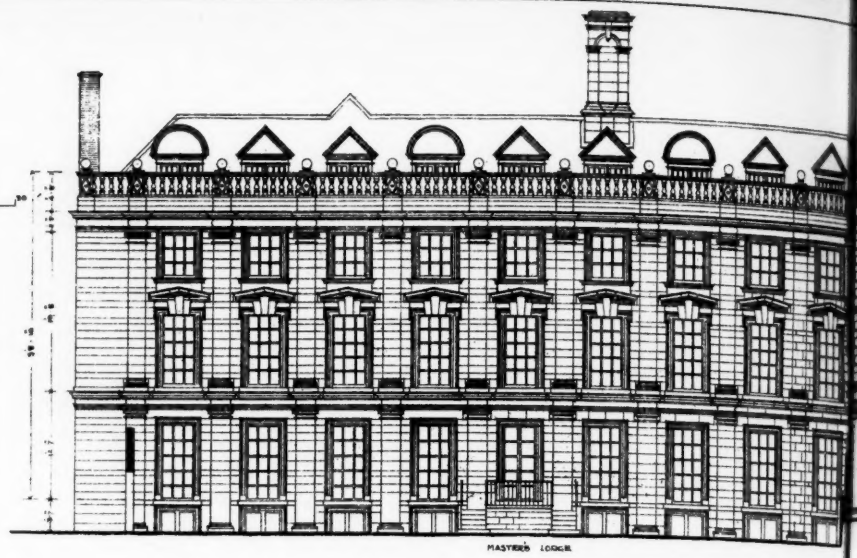
DESIGN FOR A SMALL COUNTRY CHURCH.—By Mr. Harbottle Reed.

Grissell Medal, 1898.

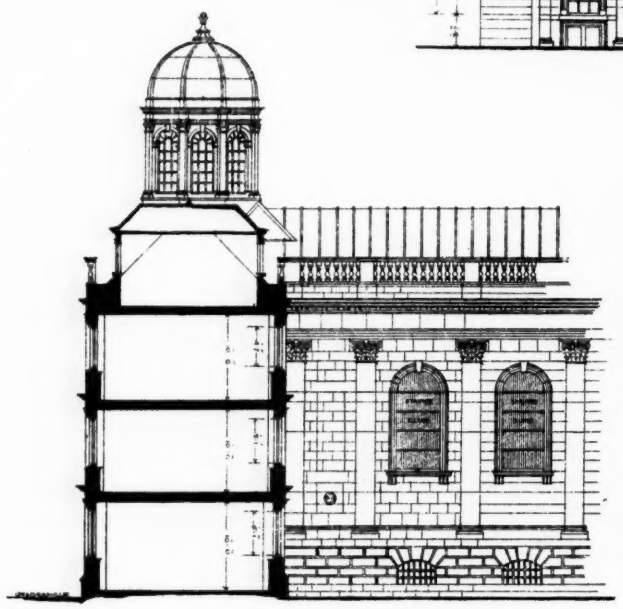
CLARE COLLEGE CAMBRIDGE

SCALE OF FEET

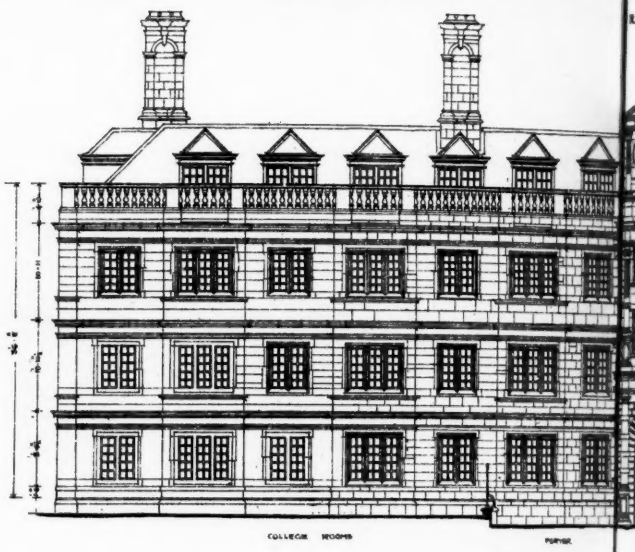
N.B. THE RIVER FRONT WAS DESIGNED & BUILT BY ROBERT GRYMBOLD MASON & WAS BEGUN IN 1669 - THE ARCHITECT OF THE STREET FRONT IS UNKNOWN



MASTER'S LODGE



SIDE OF CHAPEL



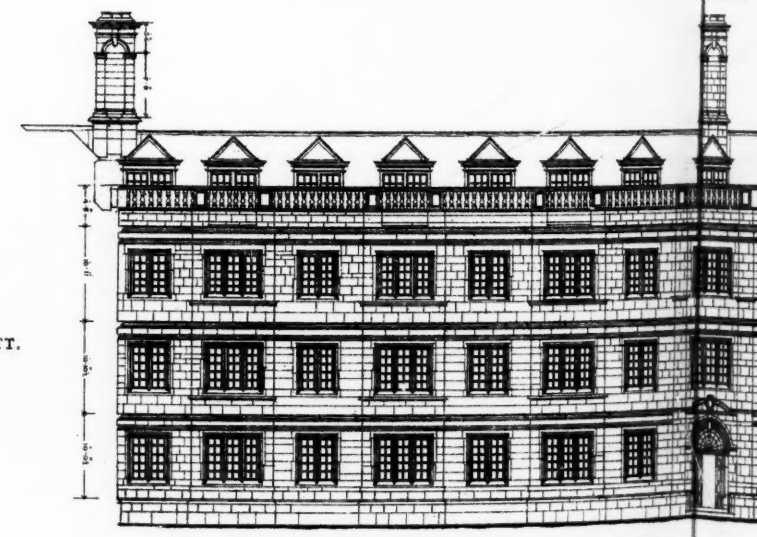
COLLEGE ROOMS PORTER

CLARE COLLEGE CAMBRIDGE

THE INTERIOR OF QUADRANGLE

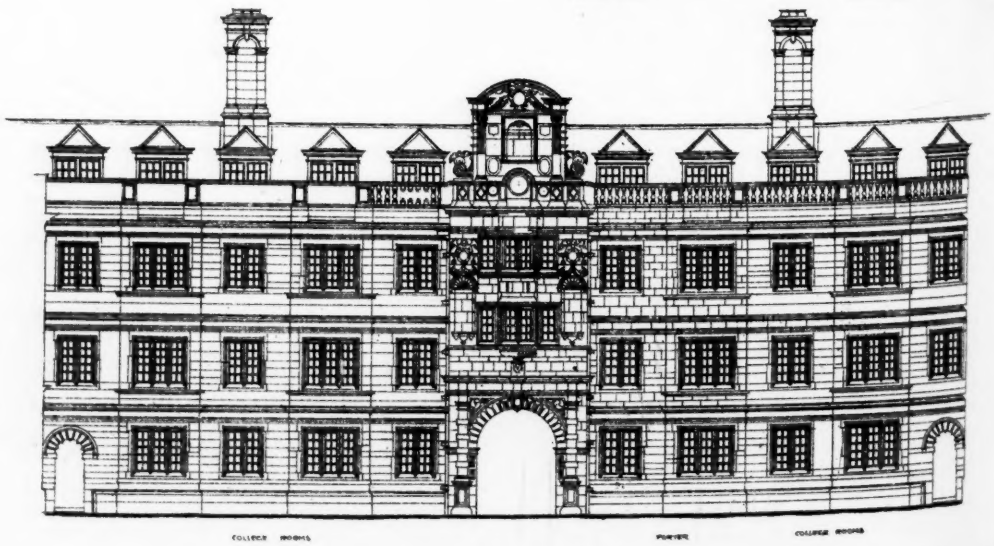
SCALE OF FEET

MEASURED AND DRAWN BY MR. T. TYRWHITT.



COLLEGE ROOMS STAIRING

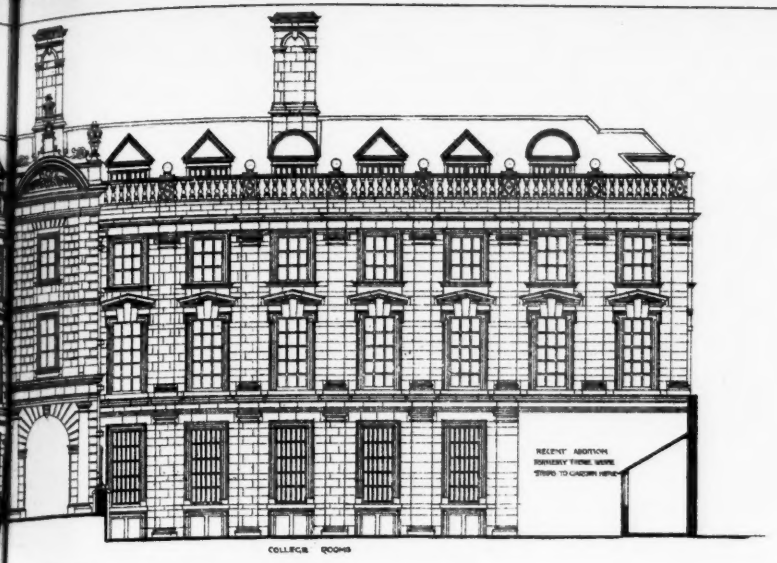
SOUTH SIDE



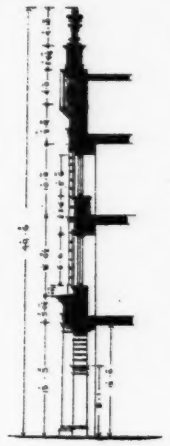
COLLEGE ROOMS PORTER COLLEGE ROOMS

EAST SIDE

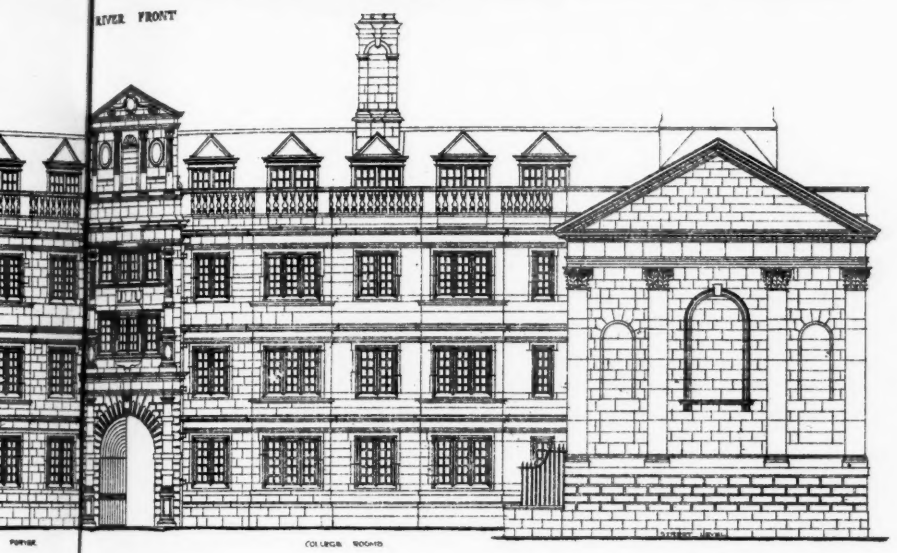
R.I.B.A. Medal, 1898.

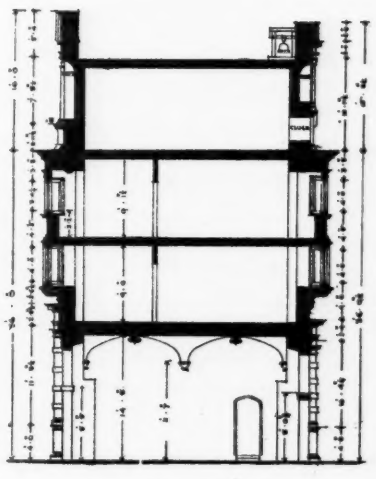


RIVER FRONT



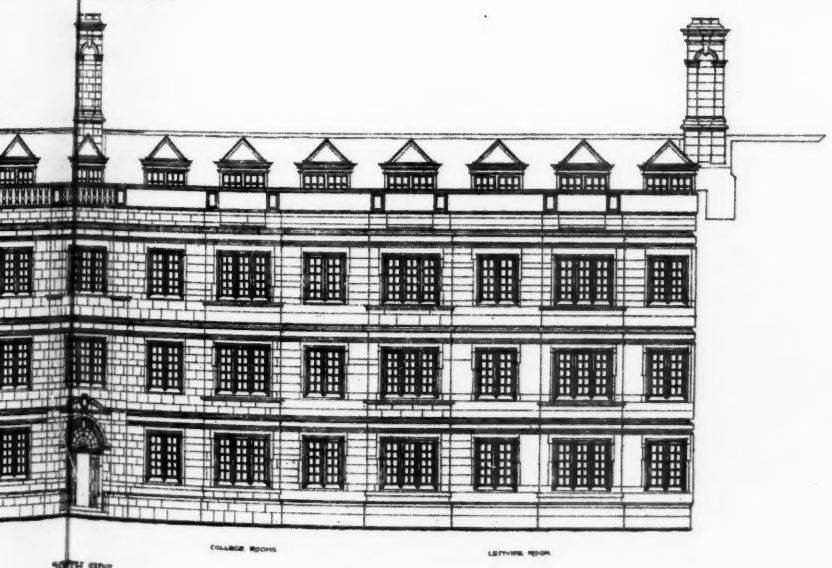
FRONT WALL OF GATEWAY





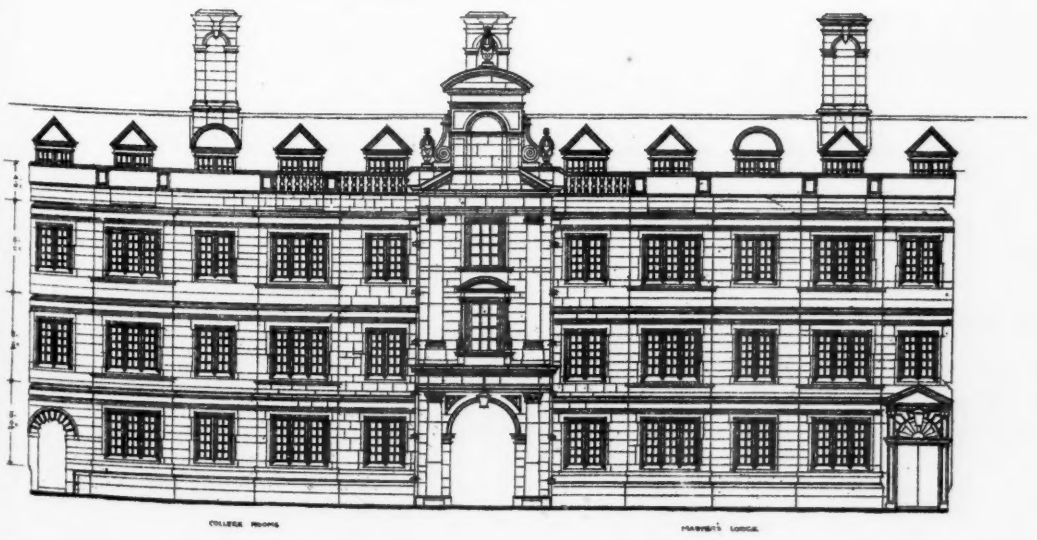
BLOCK SECTION OF GATEWAY

STREET FRONT



NOTE - THESE THREE SIDES ARE THE OLDER PART OF THE QUADRANGLE AND WERE BEGUN IN 1605. THE NORTH SIDE (NOT ILLUSTRATED HERE) WAS FINISHED IN 1715 AND IS OF LITTLE INTEREST IN DESIGN. THE CENTRAL GATEWAY OF WEST SIDE WAS PROBABLY BUILT WITH RIVER FRONT 1649

SOUTH SIDE



WEST SIDE

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.